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TENTH ANNUAL REPORT

OF THE

STATE

BOARD OF HEALTH

OF THE

LANE LIBRARY

STATE OF OHIO,

FOR THE

YEAR ENDING OCTOBER 31, 1895.

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OHIO STATE BOARD OF HEALTH,

OFFICE OF THE SECRETARY,

COLUMBUS, OHIO, *January*, 1896.

To His Excellency, WM. MCKINLEY, *Governor of Ohio:*

SIR:—In accordance with section 8 of an "Act to create and establish a State Board of Health," the accompanying report is herewith submitted for the year ended October 31, 1895.

Respectfully,

C. O. PROBST, M. D., *Secretary*.

and legacies difficult, and a study of the causes of death and means for their removal impossible, from the lack of such records. With but little inconvenience to the people, and without a greater expenditure than is now made for the purpose, it would be possible to provide for a comparatively complete and accurate system for the collection of vital statistics through the medium of the State and local boards of health. It is sincerely hoped that the next General Assembly will give its attention to this matter and make such changes in the laws as will insure the collection of information of such vital importance to all the people.

SMALL-POX.

Small-pox appeared in a number of places during the year, and in Cincinnati, Bridgeport and Martin's Ferry threatened to assume epidemic proportions. The places infected and number of cases were as follows:

Cincinnati	131	cases.
Cleveland	17	"
Toledo	3	"
Columbus	2	"
Mansfield	2	"
Lima	5	"
Martin's Ferry	6	"
Bridgeport	16	"
Pease township, Belmont county	2	"
Gallipolis township, Gallia county	7	"
Deerfield	4	"
Wellington	3	"
Addyston	2	"
Westwood	3	"
Williamsport	2	"
Ripley	1	"

At the close of the year, October 31, 1895, the disease was only present in Bridgeport, Pease township, near Bridgeport, and Martin's Ferry.

Small-pox is the most *expensive* disease, except possibly cholera and yellow fever, with which any community has to deal. Looked at from a purely financial standpoint, no effort should be spared to prevent its introduction, or to limit its spread when it is once introduced. A single case of small-pox in a small village has been known to cost many hundreds of dollars in actual outlay and loss of business, while an epidemic of the disease may bring a community to the verge of bankruptcy. Panic follows in neighboring communities, and the most irksome restrictions are placed on traffic and travel. Railroad trains are stopr searched for persons from the infected place; me of armless character, hardware, glassware, even coa sed as eight or express, and quarantine beco the

epidemic. Thirty or forty cases of small-pox in a town of small size have more than once produced such a pandemic in our own State. It behooves business men and transportation companies to use every possible means to prevent small-pox, and fortunately this may be easily done.

The city of Denver prohibits the erection of wooden buildings anywhere within her borders, and most cities establish limits from which frame structures are excluded. This is a wise precaution against conflagrations, and is fully justified, though it may work hardships in individual cases. So a community may protect itself against small-pox by requiring all of its inhabitants to be vaccinated. No fact in medicine is better established than that vaccination and revaccination will give almost absolute immunity against small-pox, and a city with all its inhabitants protected by vaccination has little to fear from small-pox. This is cheap insurance against not only great financial loss, but against sickness and death from the most loathsome of all diseases.

It is doubtless impossible in this country to enforce general vaccination except in the face of an epidemic; but the courts have sustained health authorities in requiring school children to be vaccinated, and employers could require this of all their employes. The great benefit from doing so was strikingly shown during the recent epidemic of small-pox in Wheeling, W. Va. A case of small-pox, which was concealed for fear of quarantine, occurred in the family of a man who worked at Bloch Brothers' large tobacco works in that city. The man was in constant attendance on his child at night, and other children in the family regularly attended school. No cases resulted from this exposure, and it was doubtless due to the fact that all the employes of the tobacco works and all the school children had been recently vaccinated.

No necessary expense should be spared when small-pox first makes its appearance to check its spread. A few hundred dollars judiciously spent in the beginning may save thousands. Such was the experience of one of our cities, whose actual outlay finally ran up to $3,000 per week, while the business loss was several times this amount. Business men should bear this in mind, and when small-pox appears in a community they should heartily support the Board of Health in every effort to stamp out the disease.

WATER SUPPLIES AND SEWERAGE.

To supply our cities with pure water is becoming each year more difficult and more costly. While our lake cities are, perhaps, most favored by natural advantages, the universal custom of turning crude sewage into the lake at points not far distant from where water supplies are taken has rendered these, in many instances, a source of danger.

Few if any of our rivers escape sewage pollution, and none of them affords a perfectly satisfactory supply in an unpurified state. Increasing population will soon make it absolutely necessary for the protection of the public health to prevent the pollution of sources of public water supplies, or to require such supplies to be purified by artificial means. The experience of thickly settled Europe teaches that both of these measures will eventually be necessary. For even if all crude sewage and manufacturing wastes are kept out of our streams, they still, in populated districts, receive so much surface filth as to render them unfit for domestic purposes in a raw state.

A very considerable part of the Board's work during the year has related to public water supplies and sewerage systems. It is remarkable the number of small villages that are making improvements of this kind; which speaks well for the diffusion of sanitary knowledge throughout the State.

The Board has acted upon applications from the following places for approval of public water supplies:

Ashland, Cadiz, Canal Dover, Celina, Columbus, Columbiana, Dalton, Fostoria, Lebanon, Logan, Lorain, Montpelier, Osborn, Painesville, Port Clinton, Salem, St. Bernard, Wapakoneta.

These were all approved excepting Columbus, Lorain, Painesville, Port Clinton and Salem. Approval for supplies for Lorain and Port Clinton was withheld pending further investigation.

The city of Columbus proposed to obtain an additional supply of water by placing a low dam across the Scioto river within corporate limits. The Board refused to approve this supply without purification by sand filtration, performed in a manner to satisfy the Board. Great local opposition also developed against the proposed supply, and the project was finally abandoned.

Columbus was on the verge of a water famine during the dry season of the year, and water was taken to make up the deficiency that was totally unfit for domestic use.

The typhoid fever death rate in Columbus for the past eight years shows conclusively that a contaminated water supply is being used. During that period 415 deaths have occurred in the city from this disease, which is equal to 3.86 per cent. of the deaths from all causes. This is a higher rate, on that basis, than that of any other large city in the State. It has been claimed that this high death rate from typhoid fever is due to the use of polluted well water, and no doubt many of the deaths from this disease are chargeable to that cause; but the public water supply is also polluted, and yearly distributes typhoid fever throughout the city. Columbus cannot hope to escape being scourged with this disease until a

purer public water supply is introduced, and polluted wells, wherever found, are closed.

The following places have asked for approval of sewerage systems; Ashland, Cincinnati, Cleveland, Delaware, Evanston, Hamilton, Logan, Marysville, Tippecanoe City, Warren and Wyoming.

Approval was refused in the case of Cincinnati and Cleveland. The sewerage of Ashland, already in use, was condemned. In most instances approval was given on condition that the sewage be properly purified within a reasonable, but specified time.

The Cleveland authorities requested the Board to approve a system of sewerage designed to accommodate recently annexed territory in the western part of the city. A special meeting of the Board was held in Cleveland to consider the application, and the services of Mr. Allen Hazen of Boston, a sanitary engineer, secured as consultant.

The city proposed to discharge sewage from the new sewer district into Lake Erie at a point west of the intake for their water works. Theretofore Cleveland had discharged all of its sewage east of this intake; and eastern currents of the lake, held to be more or less constant, were depended upon to a considerable extent to protect the water supply against pollution by sewage. While the intake crib is located in the lake two and one-eighth miles from the shore, it was shown that at times oil, carried to the lake by the Cuyahoga river, which discharges a little to the east of the crib, found its way into the water supply.

The proposed outlet was disapproved. At the same time it was recommended that an expert sanitary commission be appointed to consider the whole question of improving the public water supply and disposing of the sewage so as to protect the lake front against pollution.

Subsequently, at the June meeting, the Cleveland authorities appeared before the Board with amended plans. It was then proposed to discharge sewage from the new district into the lake at a point a little east of the water works crib. Plans were also presented for the extension of the present water works tunnel from two to two and one-half miles further into the lake. A copy of a special message of the mayor to the council of Cleveland was presented, recommending the appointment of an expert sanitary commission, in accordance with the suggestion of the Board. The Board voted to approve the amended plans for the sewerage of West Cleveland, and for the extension of the water intake, provided they were made to harmonize with the findings and general plans to be reported by the sanitary commission to be appointed by council, and were approved by such commission.

The commission was subsequently appointed, and consisted of Rudolph Hering of New York City, Desmond Fitzgerald of Boston and G.

H. Benzenberg of Milwaukee; all men of recognized ability in the engineering profession. The commission has reported in favor of the proposed change in water supply, but has not reported on questions of sewerage.

Some action should be taken by the General Assembly to protect all sources of public water supplies against injurious pollution. A special evil, to which attention is called, is the pollution of small streams by refuse from paper mills and straw board works. A number of complaints of this character reached the Board during the past year when streams were exceptionally low, and the evils of such pollution greatly aggravated. In the manufacture of strawboard straw is reduced to a pulp by maceration, grinding and repeated washings. Large quantities of fine particles of the straw are discharged as a waste product, and this, undergoing decomposition, corrupts the stream into which it is discharged, giving rise to bad odors and killing the fish, which adds to the nuisance. The present laws for remedying these evils seem to be defective, for although suit has been brought in many instances to prevent such pollution of streams, prosecution has failed in all but one case. There should be no great practical difficulty in keeping this straw pulp out of the streams; and there is some evidence to show that this waste product might be made worth saving.

Many of the smaller streams of the State are already grossly polluted by sewage. This is notably true of the Sandusky river at Tiffin and Bucyrus, the Blanchard river at Findlay, and the Ottawa river at Lima. Nuisances of an unbearable character have been created at all these places, and complaints of aggrieved citizens have caused them to be investigated by the Board. Under existing laws the Board is powerless to deal with such cases. It only has jurisdiction over water supplies and sewerage systems introduced subsequent to an act of 1893. The Board's power should be broadened in this direction to the end that all public water supplies may be protected against injurious pollution and our streams gradually reclaimed and purified.

LOCAL BOARDS OF HEALTH.

There are now 620 municipal and 1,118 township boards of health in Ohio. While in many places the duties of the Board of Health are greatly neglected, as a rule excellent work is being done by the local organizations. Homes have been made healthier and happier, the ravages of contagious diseases greatly lessened, and the public health measureably improved by their efforts.

Looking back over ten years' sanitary work in Ohio since the creation of the Board, it may be seen that much good has already been accomplished, while foundations have been laid for much larger and better work in the next decennium.

Secretary's Report.

Abstract of Proceedings of Meetings of the Board Held During the Year.

JANUARY MEETING.

A regular meeting of the State Board of Health was held at the office of the secretary, in Columbus, January 23, 1895, convening at 7:30 P. M.

Present: Drs. Stanton, Hoover, Kahle, Mr. Hartzell and Prof. Nelson.

Dr. Stanton occupied the chair.

The minutes of the last meeting were read and approved.

The quarterly report of the secretary was read and approved.

QUARTERLY REPORT OF THE SECRETARY.

Mr. President: In accordance with the suggestion of Prof. Nelson, the secretary has made a monthly report of the points of chief interest in the work at the office since the last meeting of the Board. A report for the month of January remains to be made. I have been called from the office but twice during the month.

On January 4, at the request of Mr. Chapin, Consulting Engineer, I met him in Wellington, and in company with the committee on water works, inspected the water supply, proposed but not then adopted, for the village of Wellington. This supply is from Wellington creek, a small stream which flows only in wet weather. To secure an adequate supply it was proposed to dam the creek to a depth of about twelve feet. Not a great distance above the point where it was contemplated placing the dam, the creek receives drainage from a large cheese factory, and also surface drainage and possibly, subsoil drainage from a cemetery. This cemetery is, perhaps, 250 to 300 yards from the creek.

I stated to the committee that it was very doubtful whether the Board would approve of this water supply; that while the drainage from the cheese factory might be cared for, or the factory removed, the possible pollution by the cemetery would condemn the supply in public opinion, and operate against its general use.

I advised that the dam be placed above both the cheese factory and the cemetery, and that a small dam be used for collecting purposes, a large reservoir being provided for storage. A sum of money, $35,000, I think it is, was voted by the people for water-works. It is questionable whether they can be built according to this plan for that amount, but the committee and engineer agreed that it would be necessary to adopt some such plan, and obtain water above the cemetery and cheese factory, in order to secure an unobjectionable supply.

I should say that there is no underground water supply to be found in that part of the State. The Board will be called upon later to approve the supply finally adopted.

January 8, I was called by telegram to North Baltimore. I learned that on Tuesday before the holidays four or five pupils in one room on the second story suddenly became comatose and remained so for an hour or more after being carried out of doors. School was at once dismissed, but no cause was found for the trouble. On the following day, ten minutes after school opened, several other children in the same room were seized in a like manner. The teacher was also affected but did not lose consciousness. Some children in the room on the first floor on the opposite side of the building were affected to a slight extent. School was again dismissed.

The janitor fired the furnace on the following Saturday and Sunday. On the latter day he went up into the room where most of the trouble occurred, and was immediately seized with great oppression of breathing, feeling, as he said, like there was a tight iron band around his chest. He reached his home, near by, in a half conscious condition, but became fully unconscious and remained so for several hours. He was still suffering with prostration when I saw him.

During the holidays the board of education attempted to find the cause of the trouble. There was a sewer in the basement without a trap. It was thought this might have caused the sickness, and it was properly trapped. School was reopened after the holidays, when the trouble again occurred in this upper room, but not to the same extent as before.

A furnace man was called in the day before I arrived, and he undoubtedly found the cause of the trouble. The building was formerly heated by natural gas, the pipe being carried in from the street and to the fire-box of the furnace, passing through the fresh air space surrounding the fire-box. Last winter and this, coal has been used in the furnace, the natural gas being shut off by two valves—one near the furnace, the other

in the street. The coal fire burnt off the end of the natural gas pipe, leaving it projecting into the fresh air chamber of the furnace. The valves, by some means, became loosened, permitting an escape of gas into the furnace, and this, no doubt, produced the sickness complained of. There was a sufficient quantity of the gas escaping to be readily lighted by a match.

There is a singular, unexplained fact in regard to the escape of this gas into the rooms. There are two furnaces; the one into which the gas escaped heats one lower and one upper room; also the halls. The other heats two lower and two upper rooms. A few children were made ill in one only of these rooms, presumably from gas admitted by means of the transom over the door opening into the hall. No one was made sick in the room immediately over the defective furnace, although the air pipe to this room is verticle and only two or three feet long. The gas seems to have nearly all been carried to the upper room, though it had to travel through six or eight feet of pipe in a nearly horizontal direction before it could ascend.

The system of ventilating the school rooms is one of the most abominable I have seen. It is sufficiently described in the following communication which I sent to the Boord of Education:

OHIO STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
COLUMBUS, OHIO, *January* 9, 1895.

To the Board of Education, North Baltimore, Ohio:

GENTLEMEN: At the request of your President, Mr. Richcreek, I investigated the condition of your north school building on the 8th instant.

From the description of the symptoms presented in the cases of the pupils, teacher and janitor, who were made sick while in this school building, in connection with the discovery of the fact that unburned natural gas was escaping into one of the furnaces, there is every probability that the trouble was due to breathing this gas. As steps have been taken to prevent further escape of gas into the furnace, if this theory is correct, you should have no further trouble from this source.

Your attention is called to some radical defects in the ventilation of this building, which you are hereby directed to have changed as soon as possible.

The foul air from all the lower rooms, including the lower halls, is admitted to the fresh air ducts, carrried to the furnace, and again sent back to the school rooms. This arrangement can not be too severely condemned, as the children are constantly exposed to all the dangers of pre-breathed air. The only air admitted to the school rooms should be pure air from out of doors. All openings or ducts for foul air should be connected with the ventilating or furnace stack.

Another defect should also be remedied. The fresh air ducts are built of wood, and the numerous cracks permit air from the basement to enter the ducts and be carried into the school rooms. These fresh air ducts should be replaced by tight metal ducts, or it may be possible to make the wooden ducts tight by calking the joints and openings. Metal ducts will, however, be safer.

Trusting you will give this matter your attention, I am,
Very respectfully,

C. O. PROBST, *Secretary.*

The small-pox case at Toledo, mentioned in my last monthly report, has been discharged. No other cases occurred.

There were two cases of small-pox at Mansfield. The latest report from there was that the patients were about well, and that there was little liability of other cases occurring.

The usual routine work of the office has continued as heretofore. Since we stopped sending the weekly health bulletins and monthly mortality reports to health officers, it has become more and more difficult to obtain reports from local boards of health.

Scarlet fever has appeared in the Asylum for Feeble Minded Youths. The superintendent reported fifteen cases.

We now have 1,615 boards of health organized. Five hundred and fifty-two municipal and one thousand and sixty-three township boards.

Respectfully submitted.

C. O. PROBST, *Secretary.*

Dr. Kahle presented a report on an inspection of the Putnam county jail. On motion, the report was received, recommendations approved, and the secretary instructed to send a copy of the report to the commissioners of Putnam county.

A communication was presented from the health commissioner of St. Louis, requesting the Board to urge the passage of a bill before Congress providing for the creation of a Federal Commission to inquire into the pollution of lakes and rivers affording water supplies for more than one state.

The Board endorsed the measure and instructed the secretary to write to Ohio's members of Congress requesting them to support the measure.

Rev. W. L. Slutz, of London, Ohio, appeared before the Board and requested permission to disinter the dead body of his child and remove it from Portsmouth, Ohio, to Columbus, Ohio.

On motion, the request was granted.

Permission was granted to D. B. Williams and Son, of Shelbyville, Indiana, to remove two dead bodies from Spring Grove Cemetery, Hamilton county, Ohio, to Shelbyville, Indiana.

A communication was presented from M. W. Harrington, Chief of the Weather Service, requesting the Board's co-operation in obtaining mortality reports, to be used in connection with reports on Climatology.

The Board expressed a willingness to assist in the work and instructed the secretary to so notify Mr. Harrington.

On motion of Dr. Kahle, it was voted to allow any one attending the

meeting of the boards of health, to be held January 24, to take part in the discussions.

The secretary made a report of an examination of frozen oranges, alleged to have been the cause of sickness. Nothing injurious was found on chemical examination, and no action was taken.

The secretary stated that one of the directors of the Ashland county infirmary had reported that institution to be in a bad sanitary condition, and requested the Board to investigate it.

The president appointed Mr. Hartzell to make the investigation.

The committee on proposed sewerage for the city of Hamilton reported, and recommended that the proposed plans be approved.

On motion of Mr. Hartzell, the report and recommendations were adopted.

The committee on additional water supply for the city of Columbus was authorized to employ a sanitary engineer to assist in the investigation.

The secretary presented a report on the proposed water supply for Dalton.

On motion of Mr. Hartzell, the report was adopted and the proposed water supply approved.

No further business presenting, the Board adjourned to meet in joint session the local boards of health at 10:30 A. M., the following day.

C. O. PROBST, *Secretary.*

MARCH MEETING.

A meeting of the State Board was held at the Hollenden Hotel, Cleveland, Ohio, March 27 and 28, 1895.

All members of the Board were present.

Dr. Stanton was in the chair.

Three members of the board of health and one member of the council of the village of Painesville were present. Also Mr. Hazen, Consulting Engineer, of Boston, Mass.

The secretary presented a report on the water supply of Painesville.

On motion of Mr. Hartzell, the report and recommendations were adopted, and the secretary instructed to forward a copy to the board of health of Painesville.

On motion of Dr. Hoover, it was voted to disapprove of the present condition of the public water supply of Painesville.

The minutes of the last meeting were read and approved.

The secretary presented his quarterly report which was received and ordered filed.

QUARTERLY REPORT OF THE SECRETARY.

MR. PRESIDENT: I have the honor to present the following report:

The proceedings of the meeting of the State and local boards of health, held in January, have been printed and will be distributed in a few days. Four thousand copies were printed.

Small-pox has appeared in Cincinnati, Columbus, Lima, Wellington and Coal City.

February 21, a colored man was found at 55 East Front street, Cincinnati, suffering from small-pox, and was sent to the hospital. Origin of case not known. March 4, another colored man with small-pox was found in the same quarter. On March 5, four others; on the 6th, two; on the 8th, three; on the 9th, two; and on the 10th one other, all colored, and all from the same quarter; were removed to the hospital.

These cases occurred in what is known as "Rat Row." As the health officer of Cincinnati expressed it "It is one of the very worst places in the United States" for small-pox.

The health officer reported that on March 6, he secured a room in the infected district, and a physician with ten sanitary officers installed was there. Then quarantine flags were placed around the square, and an officer at each corner to keep people out of the district, as far as possible. Each person in the district is obliged to carry a vaccination certificate.

March 18, the health officer reported one case in German quarter four miles from "Rat Row." On the 19th, two more cases in the same quarter. Origin of these cases not reported. On the 23rd, the health officer reported "Five new cases last two days." Two cases were reported on the 25th, and five cases Monday, the 26th. There have been thirty-eight cases in the Negro quarter and four in the German quarter.

The following item is found in the Ohio State Journal of March 26:

"SMALL-POX SCARE. TWO CASES REPORTED AT WHEELING. THE PATIENTS WERE COLORED RIVER DECKHANDS.

"WHEELING, *March* 25. Wheeling has had a small-pox scare for three days and it was made greater to-day when it was learned that the second case had been landed in the city pest house after wandering at will about the town for thirty-six hours. There are now two cases of confluent small-pox in the house. To-night the city health board and the local members of the State Board met and a quarantine was ordered on all river steamers and a rigid system of inspection provided for. Both the patients here were colored deckhands, one off the Hudson from Cincinnati, and the other off the Keystone State from Memphis. The members of the board were indignant at the steamboat officials for landing them, and a telegram was sent to Washington, calling the attention of the National Board of Health to the reckless disregard of the public safety."

March 24, Dr. Stanton reported a case of small-pox at Coal City, fifteen miles from Cincinnati, on the "Big Four" Railway. Dr. Stanton promised to investigate.

On February 21, a case of small-pox was reported at Lima. The patient had been in Chicago, where he was employed as a railroad fireman, and probably contracted the disease there. On March 6, another case was reported in Lima. This case was in a boarding house; origin, previous case. Patient died the same day the case was reported. The inmates of this boarding house were vaccinated and quarantined. Two of the boarders who were exposed, got away before quarantine was established. One went to Toledo, and from there, probably, to his home at Peoria, Illinois; the other went to Perrysburg, Ohio. I notified the health authorities of both places to look out for these men.

March 13, the third case occurred in the person of a man who had occupied a room with the patient last mentioned above.

March 19, the fourth case occurred. The patient had been constantly traveling about prior to his sickness, and the health officer believes contracted the disease outside of Lima.

In Columbus there have been two cases. One an Italian section hand, found in quarters near the city outskirts, January 29. Origin unknown. He was taken to the hospital and his gang vaccinated and held two weeks. No other cases occurred from this case.

The second case developed in a girl attending the First Avenue school, on March 11. Origin unknown. School was dismissed and the child quarantined at home. No developments from this case so far.

While in Painesville, March 18, I received a telegram from the health officer of Wellington asking me to come there and see a suspected case of small-pox. I examined the patient the following day, and found a well marked case of small-pox. A meeting of the board of health was called at once, and all necessary precautions taken. Fortunately but few were exposed, and there is not likely to be any spread of the disease. Origin unknown.

March 25, the Warden of the Ohio Penitentiary reported that several prisoners were in jail in Cincinnati, when a prisoner was brought in having symptoms of small-pox. The prisoner was removed after a short time, and the jail was disinfected. Three or four of these prisoners have been sentenced to the penitentiary, and the sheriff desired to know whether the warden would received them. I advised the warden not to receive them; and he notified the sheriff that they would not be received until permission was granted by the State Board of Health.

I wrote to the health officer of Cincinnati in regard to the matter, and he replied as follows:

CINCINNATI, *March* 26, 1895.

DR. C. O. PROBST, *Secretary of State Board of Health, Columbus, Ohio:*

DEAR DOCTOR: In reply to your communication of the 25th instant, I beg leave to report as follows:

On March 8, one Clarence Hudson was arrested for being involved in a cutting scrape, and was sent to the city hospital with a scalp wound, on that date. He remained in the hospital until the 16th inst., on which date he was sent to the county jail. On the 19th inst., he was tried in police court, and bound over to the grand jury and returned to jail. On March 21, he developed small-pox in said county jail, and when discovered had an eruption covering the entire body, and was immediately returned to the branch hospital.

I telegraphed you fully yesterday of the condition of affairs here, and have to add one more case, which developed last night.

Dr. Stanton is in to see me daily, and is giving me most valuable assistance. From his report the situation at Addyston is far from a consoling one.

Let me have any suggestions and good advice that you have to offer.

I remain, yours very sincerely,

J. W. PRENDERGAST, H. O.

As special reports, I have in my hand a report on the typhoid fever epidemic at New Philadelphia, and a report on the water supply of Painesville. I will submit these at the pleasure of the Board.

Respectfully submitted.

C. O. PROBST, *Secretary.*

Mr. Hartzell presented a report on the sanitary condition of the Ashland county infirmary.

On motion of Dr. Miller the report was adopted, and the secretary instructed to send copies to the commissioners and infirmary directors of Ashland county.

Mr. Hartzell presented a report on the sewerage of the village of Ashland.

On motion of Dr. Kahle, the report was approved, and the secretary instructed to send a copy to the board of health and council of Ashland.

Dr. Kahle presented a report on the application of Port Clinton to approve the source of a proposed public water supply.

Dr. Wise moved to adopt the report.

On motion of Dr. Hoover, the motion was laid upon the table until the morning of the following day.

Dr. Kahle presented a report on the sale of dead and unwholesome fish at Celina and St. Mary's.

Action on the report was deferred.

Dr. Stanton presented the following reports:

(*a*) On the application of St. Bernard to approve the source of a proposed public water supply.

On motion of Dr. Miller, the report and recommendations were approved and adopted.

(*b*) On the application of Evanston to approve the outlet of a proposed sewerage system.

On motion of Dr. Hoover, the report and recommendations were approved and adopted.

(*c*) On the application of Cincinnati to approve the outlets of proposed additional sewers.

It was moved by Dr. Kahle, and seconded by Dr. Hoover, that the report be received, approved, and the recommendations contained therein, adopted. The motion was carried, all voting in the affirmative.

(*d*) On small-pox at Addyston.

On motion of Dr. Hoover, the secretary was instructed to serve notice on the council of Addyston that, unless a board of health was established within three days from receipt of the notification, the State Board of Health would assume control, and at the expense of the village.

The committee on the application of Columbus to approve of proposed additional water supplies submitted a report.

Dr. Wise moved that the report be accepted and the recommendations adopted.

Mr. Hartzell moved to amend so as to provide that the filters should be in operation within twelve months after work is commenced on the dam; and that the location of the proposed wells should be approved by the Board.

The motion to amend was adopted.

The motion to accept and adopt the report as amended was adopted, all voting in the affirmative.

On motion, a recess was taken till 9 A. M. of the following day.

MARCH 28, 1895.

The Board met at 9 A. M., and, accompanied by Mr. Williams, City Engineer, went to Glenville and examined the site for the outlet of a proposed sewer.

SECOND SESSION.

At 1:30 P. M. of the same day the Board reconvened, all members being present.

Dr. Kahle presented a report on the application of Celina to approve a proposed public water supply.

On motion of Dr. Wise, the report was accepted, and the recommendation for approval adopted.

The report of Dr. Kahle on the sale of decayed fish at Celina and St. Mary's was taken up.

Dr. Kahle moved that the secretary be instructed to request the different boards of health on the Mercer County Reservoir to stop the sale and shipment of unwholesome fish.

The motion was carried.

The committee on water supplies and sewerage presented two reports on the application of the Sheffield Land Company to approve the outlet of a proposed sewerage system.

The report last made recommended that the proposed outlet be approved, provided the company would agree to purify its sewage to the satisfaction of the Board at the end of one year from the time the sewer was put into use.

Dr. Hoover moved that the two reports be received, and that the recommendations of the report last made be adopted.

The motion was carried without dissent.

The same committee presented a report on the application of Lorain to approve a change of source of the public water supply.

Dr. Miller moved that the report of the committee be received, and that the committee be instructed to continue its investigation.

The motion was carried.

The question of approving the proposed water supply for Port Clinton was taken up.

Dr. Wise, by consent, withdrew his motion to approve the supply.

Mr. Hartzell moved that the proposed water supply of Port Clinton be approved, provided evidence was presented to satisfy the Board that the prevailing lake currents are in a direction to prevent pollution from Portage river. The motion was carried.

Mr. Hartzell and the secretary presented a joint report on the application of Canal Dover to approve a proposed public water supply.

Dr. Hoover moved that the report be received, and that the supply represented by the sample of water taken from the second bored test well be approved.

The motion was carried without dissent.

The secretary presented a report on an epidemic of typhoid fever at New Philadelphia, caused by a pollution of the public water supply.

On motion of Dr. Kahle the report was received and approved.

On motion of Professor Nelson, the secretary was instructed to send a copy of the report to the board of health of New Philadelphia, with the recommendation to seek another water supply.

The application of Cleveland to approve the proposed outlets of two public sewers was taken up. Mr. Williams, City Engineer of Cleveland, presented maps showing the proposed outlets and their relative position to the intake crib of the public water supply.

Mr. Force, former City Engineer of Cleveland, spoke on the subject. Also Mr. Dare, Engineer, and Mr. Tyler, member of the board of health of Lakewood, a hamlet adjoining Cleveland, which proposed to use the outlet sewer contemplated in the plan for sewering West Cleveland.

Mr. Hazen, Consulting Engineer and employed by the Board to assist in the investigation, also spoke on the subject.

The secretary presented an opinion from the Attorney-General relative to the power of committees of the Board to approve or disapprove of proposed water supplies or systems of sewerage.

On motion a recess was taken.

At 8 P. M., the Board met a number of members of the Cleveland chamber of commerce and the question of the water supply and sewerage of Cleveland was informally discussed.

THIRD SESSION.

The Board reconvened at 10:30 P. M. of the same day.

All present except Dr. Wise. Mr. Williams, City Engineer was also present.

The question of approving the proposed outlets of sewers for Cleveland was taken up for discussion.

Dr. Hoover moved that the proposed outlets be disapproved.

Seconded by Dr. Kahle. The motion was carried with one vote in the negative.

The secretary presented a communication from the Mayor of Columbiana requesting the Board to approve the source of their proposed water supply.

The matter was referred to the president to appoint a committee to make the necessary investigation.

A petition from 562 residents of Seneca and Sandusky counties in regard to abating an alleged nuisance caused by waste from a straw board works near Tiffin was presented by the secretary.

On motion of Dr. Hoover, the secretary was instructed to assure the local health authorities that the Board would assist them to the extent of its power in abating the nuisance.

A communication from the health officer of Newark was presented requesting permission to disinter and remove three dead bodies, one of the persons for whom the permit was requested having died of "putrid sore throat."

On motion of Dr. Miller it was voted to refuse permission to disinter the body of the person who died of "putrid sore throat."

A similar request was made by the health officer of Urbana, the cause of death having been diphtheria.

On motion of Dr. Miller the request was refused.

The secretary presented a report on bacteriological diagnosis of diphtheria in the cities of Ohio, recommending that the Board should arrange for such work.

On motion of Dr. Hoover the Board voted to pay $15.00 for a map of Ashtabula which had been prepared by order of Dr. Miller.

The secretary presented a communication from the United States Agricultural Department—Weather Bureau Service—in regard to co-operative work in collecting and publishing mortality reports.

There being no further business, the Board adjourned.

C. O. PROBST, *Secretary.*

JUNE MEETING.

A regular meeting of the State Board of Health was held at the Boody House, in Toledo, June 19 and 20, 1895.

Present: Drs. Stanton, Wise, Hoover, Miller, Prof. Nelson and Mr. Hartzell. Dr. Stanton in the chair.

There were present also the following gentlemen from Cleveland: D. E. Wright, Director of Public Works; M. E. Rossiter, Director of Accounts; M. W. Kingsley, Superintendent of Water Works; W. P. Rice, Engineer of Sewers; S. G. McClure, Secretary of Board of Control; Dr. J. L. Hess, Health Officer; and Messrs. McBride, C. E. Benhaur and Webb C. Hayes, from the Chamber of Commerce.

Also the following gentlemen from Fostoria and Perry township, Wood county: U. Burtcher, Sewer Commissioner; T. D. Snyder, City Solicitor; J. P. Force, City Engineer, of Fostoria, and A. S. Brown, President, and J. W. Smith, Clerk of Perry township Board of Health, and Mr. Cory and Mr. Phillips, from that township.

On motion of Dr. Miller, it was voted to postpone the reading of the minutes of the last meeting, and to consider the matter to be presented by the delegations from Cleveland and Fostoria.

After discussion of proposed changes in water supply and sewerage in the city of Cleveland, the following was presented:

TOLEDO, O., *June* 19, 1895.

To the State Board of Health:

The city of Cleveland respectfully requests the approval of your honorable body to the plan submitted for the extension of the present water works tunnel from two to two and one-half miles north of the present crib. Would state—

1. Plans for the new intake two and one-half miles further in the lake have been prepared.

2. These plans have been accepted by the city government.

3. They have been submitted to the United States government for approval.

4. Funds are on hand with which to commence the work.

5. The work will be commenced by advertising as soon as the consent of the United States government is secured.

6. The crib can be completed this fall and winter, ready to put in place in the spring.

TOLEDO, O., *June* 19, 1895.

To the State Board of Health:

The city of Cleveland respectfully requests permission to proceed with the construction of the so-called Highland Avenue and other sewers required for Sewer District No. 13 in the city of Cleveland, with the outlet for said sewer district at or near Waverly avenue, and with an overflow outlet at Highland avenue and at such other point as may be found most feasible.

(Signed) D. E. WRIGHT,
Director of Public Works.
H. L. ROSSITER,
Director of Accounts.
SAMUEL G. MCCLURE,
Secretary Board of Control.

The pollution of East Portage creek by sewage from the city of Fostoria, was then taken up for consideration.

The secretary presented a report of a recent investigation he had made of the pollution of this creek.

The members of the Perry township board of health, farmers living along the creek, and representatives from Fostoria, were then heard with reference to the complaint.

Mr. W. G. Clarke, City Engineer of Toledo, then appeared before the Board and presented plans for two sewers which were to be built in that city. He invited the Board to inspect the proposed outlets of these sewers on the following day; the invitation was accepted, and the Board then adjourned to 9 A. M. of the following day.

SECOND SESSION.

The Board met pursuant to adjournment. Present as before.

The minutes of the meeting held in Cleveland March 27, 1895, were read and approved.

The secretary presented his quarterly report which was received and ordered filed:

QUARTERLY REPORT OF THE SECRETARY.

MR. PRESIDENT: I beg leave to submit the following report:

In my monthly report, made May 3, 1895, I gave an account of matters of interest, which had been dealt with subsequent to the last meeting of the Board which was held in Cleveland, March 27. Since the date of that report I have been called to the following places, to-wit: Lorain,

Salem, Logan, West Mill Grove, Perrysburg, New Concord and Loudonville.

The questions arising from my visits to these places will be made the subject of special reports, to be presented at the pleasure of the Board.

I have to report that all instructions received at the last meeting, as noted in the minutes just read and approved, have been carried out.

The Director of Public Improvements and the Superintendent of the Water Works of Columbus, called at the office and desired to know whether the Board would approve of a system of wells located near to and between the juncture of the Scioto and Olentangy rivers. I informed them that as this plan was in line with the recommendations contained in the report made to them by the Board on the proposed additional water supply for Columbus, the wells, if properly located, would doubtless be approved. The city council of Columbus has therefore been requested to grant an appropriation of $3,000 for putting down ten test wells. The final plans will be submitted to the Board.

I was then asked whether the Board would approve of the dam in the Scioto river, the water to be used only in case of a great conflagration, if sufficient water for other purposes were obtained from wells, as proposed. To this I gave no answer, but requested that the proposition be submitted to the Board in writing. This has not been done.

In my last monthly report I stated that I had been to Cadiz and collected a sample of water from a drilled well which, with others near it, the village proposed to use for a public water supply instead of the wells already approved by the Board. The analysis of this sample was not entirely satisfactory, and I informed the authorities that no action could be taken on their proposition until the next, that is this, meeting of the Board. Since that time the mayor has informed me that they have concluded to make use of the wells already approved.

The village of Marysville has made application for approval of a sewerage system. Prof. Nelson and myself have been appointed to make the necessary examination.

Small-pox has continued to prevail in Cincinnati. In the report on the small-pox situation in Cincinnati, made by the president and secretary May 1, a copy of which was sent to each member of this Board, it was stated that up to that date eighty-eight cases and seventeen deaths had occurred. Since that date to June 14, forty cases and seven deaths have been reported, making in all since the first outbreak 128 cases and twenty-four deaths.

Eight cases of small-pox were reported in Cleveland from April 9 to May 3; and eight additional cases have since been reported.

On May 17, a case of small-pox was reported in Gallipolis township, near Gallipolis. Instructions were sent to the township health authorities for dealing with the case. Since that time seven additional cases with two deaths have occurred there; but all these cases were in persons who were already in quarantine.

June 15, the health officer of Ripley, Brown county, on the Ohio river, reported one case of small-pox, with the prospect of more, and asked for instructions. In answer to a telegram he reported: "Woman came from Covington, Ky. Have vaccinated and quarantined; large number exposed."

Three cases were reported in Westwood, near Cincinnati. Dr. Stanton, I believe, saw these cases.

So far as known there are no other cases of small-pox in the State.

We now have 553 municipal boards of health organized, and 1,066 township boards. This leaves 132 municipal and 287 township boards unorganized.

A letter was written to the council of each municipality without a board of health, urging the establishment of such a board.

A printed letter, with printed instructions, has also been sent to the trustees of the townships which have failed to organize a board of health.

The ninth annual report of the Board has been printed, and is in the hands of the binder.

The June number of the Sanitary Bulletin is in the hands of the printer.

Respectfully submitted.

C. O. PROBST, *Secretary.*

Mr. Hartzell presented a report on the proposed water supply for Ashland.

On motion of Prof. Nelson the report was received and the proposed supply approved.

Dr. Hoover and the secretary presented a report on the proposed sewerage and water supply for Logan.

On motion of Prof. Nelson it was voted to approve the proposed source of water supply; and to approve the proposed sewerage outlet, provided the city of Logan would agree to purify the sewage in a manner satisfactory to the State Board of Health at the end of five years from the date of the first use of the sewer outlet.

Mr. Hartzell presented a report on the proposed water supply for Columbiana.

On motion of Dr. Hoover it was voted to adopt the report and approve the proposed supply.

Prof. Nelson presented a report on the proposed water supply for Wapakoneta.

On motion of Dr. Wise it was voted to adopt the report and approve the supply.

The secretary presented a report of an investigation of a nuisance at Perrysburg. The report was received and ordered filed.

Dr. Miller called up the proposals from Cleveland, which were read by the secretary.

Prof. Nelson moved that the plan to extend the intake crib of the water works of Cleveland two and one-half miles further into Lake Erie be approved.

Dr. Hoover moved to amend, by making the approval subject to the approval of the expert sanitary commission recommended to be appointed by the mayor, in a special message to council.

The amendment was carried. The motion as amended was then carried without dissent.

Dr. Hoover moved that the Board approve the plan for an outlet sewer for District 13, at or near Waverly avenue, in the city of Cleveland, subject to the approval of the sanitary commission, recommended by the mayor in his message to council; plans of the proposed outlet sewer to be furnished to the Board as soon as practicable.

The motion was carried.

The secretary presented a report on an investigation of the public school building of Loudonville, made for the purpose of determining whether the basement could safely be used for class rooms.

On motion of Prof. Nelson the report and recommendations were adopted.

Communications were read from Mr. W. B. Gerrish, City Engineer of Oberlin, in regard to complaints of their sewage farm creating a nuisance, and requesting an investigation.

On motion of Prof. Nelson it was voted to take no action in the matter unless other complaints were made.

A request from the Board of Lady Visitors that the sanitary condition of the Fairmount Children's Home, near Alliance, be investigated was read by the secretary.

On motion of Dr. Wise it was voted to appoint a committee of one to make the investigation. The president appointed Mr. Hartzell.

The secretary read a notice of the death of Dr. A. J. Scott of Loudonville, formerly a member of the State Board of Health.

Dr. Miller moved that Prof. Nelson be appointed a committee to draw up suitable resolutions in regard to the death of Dr. Scott.

Carried. Adjourned to 2 P. M.

At that time the city engineer met the Board and conducted them to where it was proposed to discharge sewage from two new sewer districts.

THIRD SESSION.

The Board reconvened at 4:40 P. M., June 20.

Present as before except Dr. Miller, who was excused to go home.

The secretary presented a report on the water supply of Lorain, including a report by Mr. George W. Rafter, Consulting Engineer.

On motion of Dr. Wise it was voted to grant permission to use the new lake intake until the two and one-half mile intake, recommended by Mr. Rafter, is completed, provided work on the new intake should proceed as rapidly as practicable.

Mr. Clark, City Engineer, brought up the question of proposed sewerage outlets for Toledo, as shown to the Board, and requested the unofficial opinion of the members as to what would be required in the way of sewage purification.

Mr. Hartzell offered the following resolution in regard to the pollution of East Portage creek by sewage from Fostoria:

WHEREAS, Complaint has been made to the State Board of Health by citizens of Perry township of a nuisance arising from the delivery of Fostoria's sewage into East Portage creek, and

WHEREAS, Said complaint has been confirmed by personal examination, and by admission of the corporation officers of Fostoria, and

WHEREAS, Messrs. J. P. Force, Engineer; U. Burtcher, Sewer Commissioner and T. D. Snyder, Solicitor, have promised that a plan of sewage purification should be built at once, plans to be submitted to this Board inside of ten days, therefore be it

RESOLVED, That if there is undue or unnecessary delay on the part of Fostoria in planning and building proper disposal works, the citizens of Perry township are hereby advised to inaugurate steps to compel proper action with a view to so purifying the city sewage and abating the nuisance complained of; and also to this end this Board will render all the aid in its power.

On motion of Prof. Nelson the resolution was adopted.

Prof. Nelson offered the following memorial on the death of Dr. A. J. Scott:

The members of the Ohio State Board of Health, having been informed of the death of Dr. Andrew Jackson Scott, a former member of this Board, at his late home in Loudonville, Ohio, on May 4, 1895, desire to place on record a brief minute expressive of our high regard for his professional career and ability, his excellent social qualities and his high moral and christian character. Though a member of this Board for a short time only, our relations were so pleasant that it is fitting that his memory be embalmed permanently on the printed reports of this Board of Health.

On motion of Mr. Hartzell the memorial was adopted.

On motion of Prof. Nelson it was voted to proceed to the election of officers.

Prof. Nelson nominated Dr. Wise for president.

Dr. Hoover moved that the rules be suspended, and that the secretary be instructed to cast a ballot for Dr. Wise as president.

The secretary reported that he had cast the ballot as directed, and Dr. Wise was declared elected president, to take his seat at the next regular meeting.

Prof. Nelson nominated Dr. Miller for vice president.

On motion of Dr. Hoover it was voted to suspend the rules and instruct the secretary to cast a ballot for Dr. Miller.

The secretary reported having cast the ballot as directed, and Dr. Miller was declared elected.

Adjourned to 8 p. m.

FOURTH SESSION.

Present as before.

The secretary presented a letter from the health officer of Zanesville in which it was suggested that the rules of the Board be changed so as to permit the transportation under proper restrictions of the bodies of persons who had died of diphtheria. Letters from most of the secretaries of the United States and Canada, answering a query as to the advisability of such a change, were also presented.

On motion of Prof. Nelson, the secretary was instructed to bring the matter before the National Conference of State Boards of Health at its next meeting.

On motion of Dr. Hoover, the president elect and secretary were appointed delegates to the American Public Health Association to meet in Denver, October 1, 1895.

A communication from Dr. Beers of Wooster was read, stating that water for a public supply was being pumped from a polluted creek, and that this new source of supply had not been approved, as required by law.

On motion of Prof. Nelson, the secretary was instructed to notify the Water Works Trustees of Wooster that the new supply must be approved by the State Board of Health.

Plans for sewage disposal at Alliance were presented by the secretary.

On motion of Prof. Nelson the plans were approved.

Letters were read with reference to the pollution of a branch of Mill creek by starch works at Arlington Heights.

The secretary was instructed to correspond with the board of health of Springfield township, Hamilton county, in regard to the complaint.

Mr. Hartzell and the secretary, committee, presented a report on proposed changes in sewerage at Salem.

On motion of Dr. Hoover it was voted to adopt the report and approve the recommendations of the committee.

There being no further business, the Board adjourned.

C. O. PROBST, *Secretary.*

OCTOBER MEETING.

A regular meeting of the State Board of Health was held in Columbus, at the secretary's office, October 30 and 31, 1895.

The Board convened at 7:45 P. M.

Present: Drs. Stanton, Wise, Hoover, Kahle, Prof. Nelson and Mr. Hartzell.

Dr. Stanton was in the chair.

It was voted to dispense with the reading of the minutes of the last meeting.

The secretary presented his quarterly report, which was received and ordered filed for publication.

QUARTERLY REPORT OF THE SECRETARY.

MR. PRESIDENT: The secretary begs leave to offer the following report:

In accordance with instructions received at the last meeting, the views of the Board with reference to propositions from Cleveland to approve proposed changes in water supply and sewerage were embodied in a report which was sent to the Director of Public Works. A copy of this report was at the same time sent to each member of this Board. It will therefore be unnecessary to reproduce it.

The Expert Sanitary Commission, suggested by this Board, was appointed. It consists of Messrs. Rudolph Hering, of New York, Desmond Fitzgerald, of Boston, and G. H. Benzenberg, of Milwaukee, all men of prominence in the engineering profession.

I met the commission in Cleveland on August 8, and gave them such information as I could on the subject of their inquiry. I also sent them, subsequently, such records as the office contained on the subject.

I was recently informed by Mr. Rice, City Engineer, that work on the new crib would be pushed forward at once. The commission has not yet reported on a plan for disposing of the sewage, but will meet in Cleveland during the week commencing November 4.

A popular sanitary convention was held in Cleveland October 25, under the auspices of the Cleveland Medical Society. I had the honor to present a paper on "Public Water Supplies in Relation to Public Health."

Col. George E. Waring, Jr., of New York, read a paper on "General Sanitation." Papers were also read by Dr. Beckwith, Dr. Hess and Prof. Staley, of Cleveland.

A joint committee on sanitation consisting of three members from each of the following bodies was organized in Cleveland in July last: Chamber of Commerce, Cleveland Medical Society, Civic Federation, Civil Engineers' Club, and the Medico-Legal Section of the Cuyahoga County Medical Society. Mr. L. E. Holden, Editor of the Plain Dealer, is president, and Dr. P. Maxwell Foshay is secretary.

The committee adopted the following constitution:

CONSTITUTION.

ARTICLE I. NAME.

The name of this organization shall be the Cleveland Joint Committee on Public Sanitation.

ARTICLE II. OBJECTS.

The object of this committee shall be the collection of all available facts bearing upon the problems of sanitation in the city of Cleveland, namely, the collection and distribution of city garbage, the improvement of the city's system of sewerage, and the betterment of the water supply, and in general the full investigation of all sanitary questions arising in this city. It shall also be the work of the joint committee to use every honorable means to enforce upon the city authorities the necessity for any such improvements in the sanitary arrangements of the city as the committee may agree are demanded. It shall also be the work of this joint committee to revise and suggest changes in the State laws concerning sanitary measures, and especially those governing the matter of taxation for sewerage and other sanitary purposes. And further, to urge upon the Legislature the passage of such revised laws as the commission shall find necessary to a complete and satisfactory settlement of the problems of sanitation with which this city is confronted.

ARTICLE III. MEMBERSHIP.

This joint committee shall be composed of three members representing and appointed by each of the corporate societies: The Medico-Legal Section of the Cuyahoga County Medical Society, the Chamber of Commerce, the Cleveland Medical Society, the Civic Federation and the Civil Engineers' Club. The term of service shall be one year, dating from July 1, each year.

ARTICLE IV. OFFICERS.

The officers of this committee shall be president and secretary, who shall be elected by the committee in July each year, to serve one year.

ARTICLE V. MEETINGS.

Meetings shall be held at such time and place as voted by the society or called by the president.

The secretary, under date of July 22, wrote, "It is our wish to be in touch with the State Board of Health, and to receive from you all infor-

mation which may aid us in our work." An appropriate answer was made.

The ladies of Cleveland have also organized what is known as The Woman's Sanitary Committee of Cleveland, and have made a valuable report on the sanitary, or rather the unsanitary, condition of the city. They are especially directing their attention to better methods for removing and disposing of the garbage. Mrs. Thomas L. Johnson is chairman of the committee.

It will be seen that a very great effort is being made to improve the sanitary condition of Cleveland.

A copy of the resolution adopted by the Board at its last meeting with reference to the pollution of East Portage creek by the sewage of Fostoria was sent to the board of health of Perry township.

The farmers of Perry township living along this creek have signed a bond for $50,000, it is said, to assist the board of health in enforcing legal measures to prevent its pollution.

On August 20, a special election was held in Fostoria to vote on issuing bonds for $30,000, for sewage purification works. The proposition was carried, and plans for the works have been prepared and adopted.

In my monthly statements to the Board I presented brief reports of investigations made as your secretary, as follows:

Report on the pollution of Pickle run at Galion.

Report on the pollution of Ritter's run by sewage from Mansfield.

Report on proposed sewerage system for court house and jail at Delaware.

Report on proposed sewage disposal works at Alliance.

Report on pollution of Sandusky river at Tiffin.

Report on proposed changes in sewerage at Port Clinton.

Report on typhoid fever at Congo.

Report on pollution of water supply at Salineville.

Report on scarlet fever at Glenford.

Report on small-pox at Bridgeport.

Report on pollution of Blanchard river by sewage at Findlay.

Report on proposed changes in sewerage at Elyria.

Report on additional water supply for Fostoria.

Report on a nuisance at Clyde, from pollution of a creek by sewage.

Report on proposed sewerage for Greenville.

Report on a nuisance at Milo, near Columbus, arising from pollution of a small run by sewage.

Report on typhoid fever at Catawba Island.

Report on quarantine against Wheeling by the boards of health of Martin's Ferry, Bridgeport and Bellaire.

Report on proposed sewage purification at Toledo hospital for insane.

It will only be necessary to refer to one of these at more length. On returning from the Congo coal mines, I sent the following communication to Mr. H. D. Turney, of this city, President of the Congo Mining Company.

COLUMBUS, OHIO, *July* 22, 1895.

MR. H. D. TURNEY, *Columbus, Ohio:*

DEAR SIR: Complaint was made to the State Board of Health by the board of health of Monroe township, Perry county, that the water furnished the residents of Congo was polluted and the occasion of sickness among its users. Samples of the water sent to our Board were examined by Prof. C. C. Howard of this city, who reported that the water presented evidence of recent contamination.

July 6, I visited Congo and inspected the source of water supply. This, as you doubtless know, is obtained from a small creek, across which a dam was constructed. There are many sources of pollution of this stream, the most serious of which is the drainage from privies of farm houses along the valley above the dam. Cattle have access to the water in the dam, and their excreta are deposited or washed into the water. I collected two samples of the water and submitted them to Prof. Howard for examination. His report shows that the water is not fit for domestic use.

While at Congo I visited several families in which cases of typhoid fever have occurred, which there is every reason to believe were caused by the use of the public water supply.

The following cases have been reported:

Two cases in the family of William Grimes; four cases in the family of James Christian; three in John Narau's; three in Mrs. Petit's; two in George Goodliff's; one in John Porter's; and one in Frank Christian's. Other cases have been unofficially reported. There have been at least two deaths from the disease.

The sanitary condition of Congo, aside from the water supply, appeared to be very good, and there can be little doubt as to the source of the disease being in the water supply.

Printed instructions for the prevention of typhoid fever have been sent to the board of health, and the board has placed a copy in each family in the village. Steps should be taken, however, at the earliest possible time, to secure a supply of pure water, which will not be liable to future contamination.

I beg to call your attention to the fact that the statutes require that this new supply shall be approved by the State Board of Health.

Trusting you will give this matter your prompt attention, I have the honor to be

Very truly yours,

C. O. PROBST, *Secretary.*

Mr. Turney called at the office the next day. He stated that he was willing to carry out any suggestions the Board could make which would insure an adequate supply of pure water. He said that apparently there was no ground water to be found in that neighborhood. I suggested a large impounding reservoir further up the valley than the one in use;

also suggested that steps should be taken to protect the supply from pollution. He said he would look into the matter, and thought the suggestion could be carried out.

On September 25, a delegation of miners from Congo called on me in reference to their water supply. They stated that they were suffering for water and that the miners a few days before had refused to work until supplied with suitable water. They also reported a number of typhoid fever cases in Congo.

There are 148 houses in Congo owned by the company. The miners say no one is permitted to work for the company unless he rents one of these houses. They claim therefore the right to be supplied with pure water.

I wrote to the board of health in Monroe township, in which Congo is situated, requesting a report of typhoid fever in Congo, and received the following reply:

CORNING, OHIO, *September* 27, 1895.

DR. C. O. PROBST, *Secretary of State Board of Health, Columbus, Ohio:*

DEAR DOCTOR: In compliance with request of the trustees to investigate the sanitary condition, etc., of Congo, Ohio, we, W. S. Graver, C. W. Roof, Thomas Platt and Dr. R. D. Book, after a thorough examination, beg leave to submit the following report:

No attention was paid to the water supply. A special canvass was made of houses and the following sick were found:

Johanna Chaney, sixteen, sick since September 2d, fever; Dr. Minich in attendance.
Harvey Chaney, eighteen, sick since August 23rd, fever, Dr. Minich.
Susanna Toth, six, sick four weeks, very low, fever; Dr. Minich and Dr. Barnes.
Ella Murphy, thirteen, sick two weeks, pains in abdomen. Parents say doctors claim no fever. Dr. Minich.
Maggie Murphy, seven, sick three days, pains in head and back, fever, Dr. Minich.
Jane Smith, twenty-nine, sick eight days, pains in the head and back, fever, Dr. Minich.
Mary Kelly, fourteen, sick three weeks, died, typhoid fever, Dr. Minich.
Nora Kelly, twelve, sick four weeks, fever, Dr. Minich.
Viola Post, five, sick three weeks, fever, Dr. Aurand.
Wm. Smith, fourteen, sick three weeks, typhoid, Dr. Aurand.
Edward Davis, sixteen, sick four weeks, fever, Dr. Minich.
J. R. Cadle, forty-one, sick four weeks, fever, in bed, very low, Dr. Minich.
Andy Cleets, twenty-six, sick six weeks, fever, Dr. Aurand.
Addie Petit, ten, sick two weeks, fever, Dr. Holcomb.
Robert Breckenridge, twelve, sick five weeks, fever, Dr. Minich.
Goldie Bailey, nine months, sick four weeks, fever, Dr. Minich.
D. A. Powers, thirty-seven, sick three weeks, fever, Dr. Aurand.
Eugene Bixler, fifteen, sick three weeks, fever, Drs. Minich and Aurand.
Mary Dillehea, seven, sick two weeks, fever, Dr. Cummings.
James Dillehea, forty, sick one week, in bed, fever, Dr. Cummings.

These people are all either sick in bed at present, or are just recovering, and this list of names has no connection with those you already have. In regard to diagnosis of these cases, the physicians differ—some pronouncing it typhoid, others typhoid malaria, and others malaria. Again they have it malaria with typhoid symptoms.

Quite a number of the water closets have been condemned, and steps will be taken to abate this nuisance, which has become general.

Water is furnished these people at present from the Muskingum river at Zanesville. It is carried in old oil tanks which were formerly used for transporting crude petroleum, and for this reason it is not fit to use.

Respectfully,

(Signed) R. D. Book, M. D.
Thos. Platt, *Pres. Bd. H.*
W. S. Graver, *Twp. Clerk.*
Chas. W. Roof, *Sanitary Officer.*

I desire to be instructed as to what, if any, further action should be taken in the matter.

I would recommend that the January meeting be made, as usual, a joint meeting of the State and local boards of health, and I should like to have suggestions in regard to the program.

I wish to incorporate in our annual report, reports from the local boards of health. If the members have any suggestions as to information it would be desirable to collect in regard to any special work local boards of health are or should be doing, I should be pleased to receive them.

In addition to the cases of small-pox already reported, one case has been reported at Wheeling Creek Coal Works, in Pease Township, near Martin's Ferry; one in Toledo; and two in Bridgeport.

The Clerk of Pease Township reported that the case there was brought from Wheeling on the 25th of September, the woman being sick at the time. The family to which she was taken was promptly quarantined and vaccinated, and no other cases have developed to date.

I wrote to the health officer of Wheeling in regard to the sending of this case to Ohio, and he reported that she came from Benwood, where several cases have recently developed. I then wrote to the health officer of Benwood, who reported that no such person was known in Benwood.

The case in Toledo was reported on the 18th instant. Nothing is known as to the origin of the disease except that the patient is an engineer in a paper mill, and used the rags brought in, for the purpose of wiping the machinery.

October 21, the health officer of Bridgeport reported a case of small-pox in Ætnaville, a ward of Bridgeport. He says, "Have not been able to trace it to the old cases in the above ward."

October 26, he reported another case in the business part of the city The origin of this case is also unknown.

I attended the meeting of the American Public Health Association, held in Denver, commencing October 1, but Dr. Wise, your other delegate, has offered to make a report of this meeting.

The Emergency Board, as previously reported, gave permission to

create a deficiency not exceeding $2,000, but it should be understood that this sum is not actually available.

Respectfully submitted,

C. O. PROBST, *Secretary.*

Dr. Kahle presented a report on the sewerage system and sewage disposal works proposed for Greenville, including the plans and specifications of the consulting engineer, Mr. J. P. Force.

On a motion of Dr. Wise it was voted to adopt the report and approve the plans.

Prof. Nelson presented a report on additional sewerage for Warren.

Mr. Hartzell moved that the plans for additional sewerage be approved, provided sewage purification works, satisfactory to the Board, shall be built within two years from the date of the first use of the new sewers, and provided further, that all sewage from Warren shall be by that time satisfactorily purified before discharging it into the Mahoning river.

The motion was adopted.

Prof. C. C. Howard presented a report of the chemical examination of the water supplies of twenty-nine cities.

Prof. Nelson offered the following resolution, which was adopted:

Resolved: First, that the secretary of the Board be and he is hereby requested to prepare a series of questions pertaining to the public water supply of towns and cities.

Second, that a circular containing these questions be sent out to the proper authorities in all the towns and cities in the State having a public water supply, at such times as to secure returns on the 1st day of April and September in each and every year.

Dr. Wise presented a report as a delegate to the Denver meeting of the American Public Health Association.

The report was received and ordered filed for publication.

On motion of Dr. Kahle it was voted to publish Prof. Howard's report on water supplies of Ohio cities in the next annual report.

Dr. Hoover presented a report on the pollution of the Scioto river and canal by the straw board works at Circleville.

The report was received and filed.

Dr. Stanton reported progress in investigating the water supply of Xenia. The committee was continued.

Dr. Wise, President elect, then took the chair.

Adjourned to 9 A. M. the following day.

SECOND SESSION.

The Board met pursuant to adjournment.

Present as before.

An application from the engineer, Mr. Jay F. Brown, to approve plans for sewerage proposed for the village of Glenville was considered.

On motion of Prof. Nelson, it was voted to suspend action until after receipt of the report of the sanitary commission on the disposal of the sewage of Cleveland.

The secretary and Prof. Nelson reported verbally on the water supply of Delaware, stating that the supply was being obtained direct from the Olentangy river, and recommending that steps be taken to develop the ground water supply adjacent to the present pumping works.

Dr. Stanton offered the following resolution, which was adopted:

Resolved: That the use of the Olentangy river water at Delaware as a source of domestic supply is to be condemned, and that it is recommended that needed additional supplies be sought for in the sand and gravel in the vicinity of the pumping works.

It was voted to print the report of Prof. Howard on examination of water supplies in the next *Bulletin*.

On motion of Dr. Stanton a vote of thanks was tendered Prof. Howard for his interesting and instructive report.

Correspondence was read from Dr. Brown and the board of health of Lebanon; Dr. Brown charging that the health officer had shown partiality in not quarantining cases of contagious disease reported by certain physicians. The following resolution of the board of health was read:

Resolved: That upon investigation of the charges made by Dr. Brown against Dr. Frost, Health Officer, contained in a letter from the State Board of Health, we find upon hearing the statement of both gentlemen that there is no just ground for believing that Dr. Frost has neglected his duties or shown any partiality as health officer.

Resolved further: That in our opinion Dr. Brown in making the charges, believed he had just ground for making the same but was unacquainted with all the circumstances.

Passed October 29, 1895. M. E. GUSTIN, *President.*

Attest: D. HIRAM BAIN, *Clerk.*

The matter was left with the secretary for further investigation.

On motion of Dr. Kahle, permission was granted George G. Keeler, of Toledo, to remove the remains of his wife, who died of exhaustion thirty-one years ago, from a family burial ground to a cemetery in West Toledo, using an ordinary rough box for holding the remains.

Dr. Kahle presented a communication from H. H. Roush, of Leipsic, regarding a nuisance arising from faulty sewerage.

The secretary was instructed to call the attention of the local board of health to the matter.

Correspondence was presented from the board of health, Mr. Hathaway and others, of Marietta, in regard to permitting the use of certain private sewers.

Mr. Hartzell offered the following resolution, which was adopted:

Resolved, That it is the opinion of this Board that no sewage should be permitted to be discharged into the Muskingum river above the dam; that all old sewers should be abandoned except for storm water purposes, and should not be permitted to be connected with the new system of sewerage.

The secretary reported on typhoid fever contracted at Lake side.

On motion of Prof. Nelson, the secretary was instructed to continue the investigation.

Dr. Hoover gave notice that at the next meeting he would offer an amendment to the by-laws providing for the abolishment of all standing committees except the finance committee.

The president appointed Messrs. Hoover, Stanton and Hartzell a committee on finance.

It was voted to hold a joint meeting of the State and local boards of health, following the next regular meeting of the Board.

The program was left to the president and secretary.

There being no further business, the Board adjourned.

C. O. PROBST, *Secretary.*

SPECIAL REPORTS

—ON—

A. Contagious Diseases.

B. Public Water Supplies.

C. Sewerage Systems.

D. Sewage Disposal Works.

E. Nuisances.

F. Inspection of Public Institutions.

CONTAGIOUS DISEASES.

REPORT ON TYPHOID FEVER AT NEW PHILADELPHIA, OHIO.

BY C. O. PROBST, M. D., SECRETARY.

A request was received from the board of health of New Philadelphia, February 2, to come there on account of an outbreak of typhoid fever. I arrived there February 5.

New Philadelphia is the county seat of Tuscarawas county, with a population of between 5,000 and 6,000. The main part of the town is built on comparatively level land at the foot of surrounding hills. The soil is sand and gravel for sixty feet or more in depth; water is found in wells at an average depth of fifty-five feet from the surface. To the east the surface slopes rather abruptly to the Tuscarawas river, leaving a broad river bottom between the main part of the town and the river. The sub-soil drainage is probably from the town to the river. Surface drainage in part escapes directly into the river and in part is cared for by storm water sewers which discharge into the river above the water works pumping station. There is a short line of sewer, for house drainage, discharging into the river below the pumping station.

Canal Dover, a town of about 4,000 inhabitants, situated on the Tuscarawas river about three miles above New Philadelphia, discharges sewage into a canal, which, by a waste way, finds its way into the river.

About eight years ago water works were constructed by the American Water Works Company of Pittsburgh, Pa., the pumping station being placed on the river bottom about 100 yards from the river and not far above a line running through the center of the town east and west. Water was taken directly from the river. Two years ago ten 6-inch driven wells were sunk in the sand and gravel about midway between the pump house and the river. Water was found twelve to fifteen feet below the surface; most of the wells are twenty-five feet deep. The supply pipe to the river is still in place, but, it is claimed, is not used. Water is pumped to a reservoir on a high hill near the town, and service is from both the reservoir and the pumps.

The majority of the people still depend upon wells for domestic supply. Uncemented privy vaults are in common use. One abandoned

well, filled with loose brick, receives urinary discharges; another, waste water from a barber shop.

The privy vault nearest to the wells at the pumping station is about 500 feet away, and is used by employes of a rolling mill located on the river bottoms.

New Philadelphia, for many years, has been remarkably free from typhoid fever; but malarial fevers prevail there to a considerable extent. Typhoid fever appeared in the village April 5, 1894. There was a lull, with three cases in that month, and then one case September 1, one October 2, one November 10, eight in December, sixteen in January and fifteen in February, making forty-five cases in all. No cases have occurred since February 27. Thirty-eight houses were infected.

Following my visit of February 5, repeated chemical and bacteriological examinations were made of the public supply. Being called to Canal Dover February 28, I met the board of health of New Philadelphia on the evening of that date, Mr. Hartzell being with me. A partial report was made to the Board at that time, and another set of samples of water collected for bacteriological examination.

The following report, showing the result of the investigation, was transmitted to the board of health of New Philadelphia on March 18:

OHIO STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY, COLUMBUS, O., *March* 18, 1895.

To the Board of Health, New Philadelphia, Ohio:

GENTLEMEN: At your request the State Board of Health has caused an investigation to be made to determine the cause of the typhoid fever in your village. During November and December, 1894, and January and February, 1895, to the 5th, twenty-six cases of the disease, with two deaths, were reported. Nine additional cases have been reported to February 28.

The evidence presented by your board at the time of my visit, February 5, led us to suspect that the public water supply is at fault. Of the thirty-seven cases reported, all but three used hydrant water in part or exclusively. More than two-thirds of these cases drank only of the hydrant water. Another significant fact is that a number of these patients were school children who used hydrant water at school and well water at home, no other cases occurring among other members of their families.

The milk supply is excluded as the cause from the fact that five or six different dairymen furnished the milk used by the patients. No suspicion is attached to any other article of food or drink.

There is no evidence to show that the disease has been communicated from one to another by personal contact.

Samples of the public water supply were collected by your clerk, Mr. J. H. Officer, and were submitted to Prof. C. C. Howard and Prof. A. M. Bleile, of Columbus, for chemical and bacteriological examination. Prof. Howard made the following report:

February 13, 1895.

J. H. OFFICER, *Clerk of Board of Health, New Philadelphia, Ohio:*

DEAR SIR: The sample of water received from you February 8, proved to contain so large an amount of certain constituents indicating contamination of the water, while

others were not increased as would be expected in a contaminated water, that I asked for another sample with which to make a re-examination. This came this morning and I have completed an examination of this sample. Following are the results of the examination of the two samples; while for convenience of comparison the figures for the samples examined last summer are given:

1. Sample, August 16, 1894. 2. Sample, February 8, 1895. 3. Sample, February 11, 1895.

Parts per 100,000.

	Oxygen required.	Free ammonia.	Albuminoid ammonia.	Organic ammonia.	Nitrous acid.	Nitric acid.	Chlorine.	Total solids.
1.	.11	.001	.007	.....	trace.	.012	.68	35.6
2.	.15	.071	.017	.022	.001	.037	.42	44.8
3.	.09	.002	.006	.008	trace.	.030	.40	43.6

The nitrous and nitric acids, chlorine and total solids in 2 and 3 are in sufficiently close agreement to indicate they are the same water, but there is a marked difference in the ammonias and oxygen required. With the exception that the total solids in 2 and 3 are some higher than in 1, there is sufficient likeness in all the other constituents to indicate that 3 is a water of the same class as 1, except that it is a little harder. From this I would infer that the water at present differs from that examined last August in containing more mineral matter, but as far as freedom from contamination, it is substantially of the same character as the former sample. It will be recalled that I expressed considerable satisfaction concerning that sample, and as far as organic purity is concerned, I am obliged to express the same favorable opinion concerning this sample. There is no evidence from a chemical examination of the water that any decomposing organic matter, or indeed, organic matter not in a state of decomposition, has gained access to the water since the former examination. It is not impossible that typhoid fever germs have gained access to the water since that date; it is understood that these can not be detected by a chemical examination, but if such be possible, I am obliged to insist that they are accompanied by a very small amount of organic matter, so small that it can not be perceived in the difference of analysis.

The similarity of 2 and 3 in several constituents has been pointed out. The sample 2, however, contained a very large quantity of free ammonia, so that Nessler's reagent added to the original water gives a deep brown color, and when a half litre is distilled the reagent gives a precipitate red as .071. The albuminoid and organic ammonias are both notably increased. This indicates the presence of some nitrogenous substance in a state of decomposition. What this is or how it came in the sample I have no idea, but believe that it is an accidental contamination and not from the water as drawn from the well.

Yours truly,

CURTIS C. HOWARD.

It appears that so far as chemical examination goes the water seems to be of good quality. Different conclusions must be drawn from the bacteriological examination. Bacilli were found in three of four samples examined. Twenty minims of the water injected into a white rat killed it. The appearance of these bacilli under the microscope, and their behavior under cultivation, indicate positively that they are either the bacilli of typhoid fever, or the bacillus coli communis. In either case this means that in some manner the public water supply has been exposed to fecal contamination. This is very significant when considered in relation to the fact that the public water supply is derived from shallow wells placed in a line to intercept the ground water which flows from your town to the river.

It is true that the nearest visible source of fecal pollution of the wells is a privy vault 500 feet distant, and that the intervening soil is sand and gravel, which ordinarily afford good filtering qualities, but the distance to which typhoid fever germs may be carried under ground has yet to be determined.

Your river receives sewage from Canal Dover, but a short distance above your water works. We are assured by the superintendent of the water works that water has not been pumped from the river for many months prior to the outbreak of typhoid fever.

From whatever source, it is certain that the public water supply has become contaminated with bacteria which only came from the intestines of man or animals. Following is the bacteriologist's report:

OHIO STATE UNIVERSITY, COLUMBUS, O., *February* 26, 1895.

DR. C. O. PROBST, *Secretary of State Board of Health:*

SIR: I herewith submit my report on bacteriological examination of water from New Philadelphia.

On February 8, were received two bottles of water but with the contents frozen solid, and therefore in an unsatisfactory condition for this work.

An examination of these samples showed numerous micro-cocci but other forms were not found.

Another set of two samples was received one week later. From each of these twenty minims was injected into the peritoneal cavity of white rats. One of the rats died in five days, and the post mortem made showed marked gaseous distension of the intestine, and in the small intestine numerous small points of ulceration.

The water itself gave a small number of bacilli corresponding morphologically and in their behavior to stains. No typhoid bacilli or b. coli commune.

The above waters were not labeled but were taken, as I understand, one from the well, the other from a hydrant.

A third set of samples was received February 21.

This water again showed the same rod bacteria and micro-cocci.

Potato cultures were made from these samples and in a few days the almost invisible growth which had spread over the whole surface was examined. It was found to consist of rod bacteria in all respects like typhoid bacilli.

While it may be too sweeping, in the present state of bacteriological knowledge, to assert positively the presence of the typhoid bacillus in this water, it is nevertheless true beyond a doubt that the bacteria found, even if taken only for the bacillus coli communis, demonstrate food contamination.

Respectfully,

A. M. BLEILE, M. D.

From the foregoing it appears to the highest degree probable that the pollution of the public water supply is the cause of the typhoid fever you are having in your village.

It is impracticable to at once stop the use of this supply, but an impressive warning should be given to all who are using it that security against typhoid fever requires that only water which has been boiled shall in any way be taken into the stomach. All schools should be supplied with water that has been boiled, or water from a well of known purity. As the present experience may be repeated in the future, steps should be taken to obtain a public water supply which will be free from danger of pollution.

The substance of this report was communicated to your Board verbally at the time of my last visit, February 28. On the following day Mr. Officer and myself collected samples for bacteriological examination at the following places to-wit: From the reservoir, from the wells at pumping station, and from a hydrant on a branch main. A sample of the deposit at the bottom of the reservoir was also taken. These were submitted to Prof. Bleile for examination, who has reported as follows:

OHIO STATE UNIVERSITY, COLUMBUS, O., *March* 15, 1895.

DR. C. O. PROBST, *Secretary of State Board of Health:*

DEAR SIR: Herewith I present report of bacteriological examination of waters from New Philadelphia. This lot includes the four samples marked as follows:

No. 1. Scrapings from bottom of reservoir, March 1, 1895.

No. 2. Hydrant. Branch main, March 1, 1895.

No. 3. Reservoir S. E. side, March 1, 1895.

No. 4. From wells at pumping station, March 1, 1895.

Examination of these waters was begun March 4.

1. From each sample twenty minims wss injected into white rats. The animal injected from No. 4 (wells) seemed somewhat stupid on Friday, March 8, but next day had fully recovered and has since been normal. None of the other rats exhibited any signs of ill health.

2. Inoculations were made on potatoes and these kept in an incubator at 33° C.

3. Peptone Agar tubes were inoculated and kept at 33° C.

On all of these media was there a growth came out most luxuriantly on cultures from No. 1 (scrapings). No. 4 (wells) gave a somewhat larger growth than did the other samples. In all, three varieties of bacteria were found. Two forms of bacilli and one coccus. As nearly as they could be identified they were the liquifying bacillus, the bacillus auranti, and the micrococcus albus.

These are forms frequently found in air and water and are not pathogenic.

There was no trace of the typhoid bacilli found on former occasions.

From the above examinations, which show the absence of pathogenic bacteria, and the others present in a few species only, the water should be pronounced safe.

A. M. BLEILE, M. D.

These examinations indicate only that the samples of water collected March 1, were free from disease producing bacteria.

Whether the public water supply may now be pronounced free from danger will depend largely upon the non-occurrence of cases of typhoid fever traceable to hydrant water since that date. If none have occurred it may be presumed that the water is no longer infected. In determining this the usual incubation period of typhoid fever must be taken into consideration. That is, a person who drank infected water March 2, would not be taken sick till ten to fourteen days later.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON DIPHTHERIA AT DELTA, FULTON COUNTY.

BY C. O. PROBST, M. D., SECRETARY.

A telegram was received from the Mayor of Delta, November 23, requesting me to come there immediately on account of an epidemic of diphtheria. I went there the following day.

I was informed that about two years ago, diphtheria appeared in the township near the village. It spread from this point, gained access to the village, and a number of cases occurred, both in the village and in the surrounding country. It was stated that within a radius of ten miles from Delta thirty-seven deaths had occurred from the disease, including five deaths in the recent outbreak.

The village was free from the disease for some months after this epidemic until in August, 1894, a child of Mr. Bartholomew, an undertaker of Delta, was taken sick, the disease being pronounced tonsillitis. Children in the family continued to go to school; other cases of sore throat occurred in the neighborhood, and in the week prior to my visit five deaths, from what was doubtless diphtheria, including two deaths from membranous croup, occurred. This caused great public alarm. There were seven or eight additional cases of diphtheria in the village.

The board of health was having trouble because two of the principal physicians were calling all their cases of sore throat tonsillitis, and not reporting them to the board. In two instances, the board informed me, the diagnosis of tonsillitis was changed to diphtheria just prior to death. All but two or three of the cases were in children attending one department of the public schools.

The school building has the Smead Dry Closet System, and it was stated by many persons in a position to know that this has never given satisfaction; that the room in which the diphtheria cases occurred, and another room, both being on the first floor and near to the closets, are frequently filled with foul odors. It was suspected that the diphtheria cases were caused by these closets.

Recognizing the difficulty of proving the diagnosis of diphtheria to the court, should an attempt be made to prosecute physicians for failure to report cases of the disease, I advised the board of health to adopt a resolution requiring all physicians in Delta to immediately report to the board of health all cases of tonsillitis, croup or acute sore throat of any kind. This was done. I also advised the board to placard all houses in which such cases are reported, using a card bearing the words "Contagious Disease Within," and prohibiting entrance to or exit from the premises without permission from the board. This was agreed to.

I called on all the physicians in Delta, and without exception they agreed to comply with the request to report all cases of sore throat, and to assist the board in preventing spread of the disease.

In company with the board, superintendent of schools and other citizens, I inspected the school building. It had been closed since Thursday noon. The inspection was made the following Sunday afternoon. The building is heated and ventilated by the Smead System, and the basement rooms containing the dry closets were filled with a disagreeable odor. This was also noticeable in the school rooms above. It has already been stated that during school hours, when the ventilating stacks are heated, bad odors are frequently noticeable in the school rooms. The ventilating stacks extend but a short distance above the roof, and between

them is a cupola which rises twelve feet or more above them. It is probable that this arrangement of the stacks is in part accountable for their failure to properly ventilate the school building.

In my judgment, diphtheria was introduced into the school room in which nearly all of the cases occurred, by some child suffering from an unrecognized case of the disease, or coming from a house containing some one having the disease. The fact that the pupils were exposed to foul emanations from the dry closets may have contributed both to the spread of the disease and to increasing its malignacy.

REPORT ON SMALL-POX AT ADDYSTOWN, HAMILTON COUNTY.

BY BYRON STANTON, M. D.

To the State Board of Health:

GENTLEMEN: Having been notified of the existence of small-pox in the village of Addystown, Hamilton county, and having been requested by the clerk of Miami township, in which Addystown is situated, to visit the place, I went there on the 25th instant, and found that a woman who had contracted the disease in Cincinnati had been sent to the small-pox hospital early in the morning of that day, and that her husband was then sick with what was supposed to be the primary fever of variola. Two sanitary policemen had been appointed by the mayor and were placed as guards over the house in close proximity to the one in which the disease first appeared. The quarantine, however, was very inefficient, as persons were seen coming from and going to the quarantined district at all hours of the day.

Addystown has not now a board of health or health officer, but by authority of the council the mayor was directed to take charge of all matters in connection with the epidemic. The measures resorted to seemed to me to be very inadequate for an emergency of this kind, and I would recommend that the secretary of the Board be directed to see that the law in regard to boards of health in villages be complied with.

PUBLIC WATER SUPPLIES.

REPORT ON ASHLAND WATER WORKS.

BY JOSIAH HARTZELL, PH. D.

The proposed water works of Ashland will be built by and belong to the corporation. Work on same is to begin at once.

The water will be distributed through twelve miles of iron piping varying in diameter from ten to four inches. There will be over 300 fire hydrants, or more than double the usual number. In view of the large expense involved in the cost and maintenance of hose it is argued that there is economy in having plenty of carefully distributed hydrants.

The pressure will be derived from the stand pipe seventy-five feet high and twenty feet in diameter. The location of this is on an eminence approximately 100 feet above the village and 200 feet above the pumping station. The pumping plant is to be capable of delivering 2,000,000 gallons of water into the stand pipe daily. Its distance from the village is one and one-half miles.

The water is derived from wells, iron cased, to the water-bearing stratum, which is at an average depth of twenty-seven feet. The collecting well will have a diameter of ten feet—the other wells in position were of four inch pipe.

The quantity of water would appear to be abundant. Eight wells were flowing continuously at the height of one and two feet above the surface. I was informed by the engineer in charge, Mr. J. B. Strawn, that pumps had been applied to the wells, and that pumping from one well showed no diminution of flow from any of the wells, except in one instance. The first well was put down in August, 1894, a very dry time, and the flow has not since perceptibly varied.

The quality of the water is apparently good, and its appearance is good. Pebbles in the bottoms of drains from several of the wells showed some iron discoloration. The iron does not seem to be present in sufficient quantity to seriously impair the quality of the water. The water is hard.

Following is a report of the chemical examination of two samples of water furnished by Mr. J. B. Strawn, the Consulting Engineer:

COLUMBUS, O., *March* 14, 1895.

DR. C. O. PROBST, *Secretary of Ohio State Board of Health, City:*

DEAR SIR: I have made an analy.is of the two samples of water received from Ashland with the following results:

Parts per 100,000.

	Oxygen required.	Free ammonia.	Albuminoid ammonia.	Organic ammonia.	Nitrous acid.	Nitric acid.	Chlorine.	Total solids.
1.	.07	.005	.004	.008	trace.	.010	.60	36.2
2.	.06	.004	.006	.010	trace.	.015	.40	39 6

These waters are quite similar in quality; in several of the constituents the figures are within the limit of delicacy of the method. These results indicate that they are both of very fair quality. In a surface water a figure of .001 or less for free ammonia is found in waters of the highest purity, but if these samples can be regarded as derived from the lower strata the higher numbers here found would be entirely without significance. From the very low numbers for all the other constituents it would hardly be proper to attribute the slightly higher figures for free ammonia to the recent decomposition of organic matter. All other figures indicate a water of very good quality.

Yours truly,

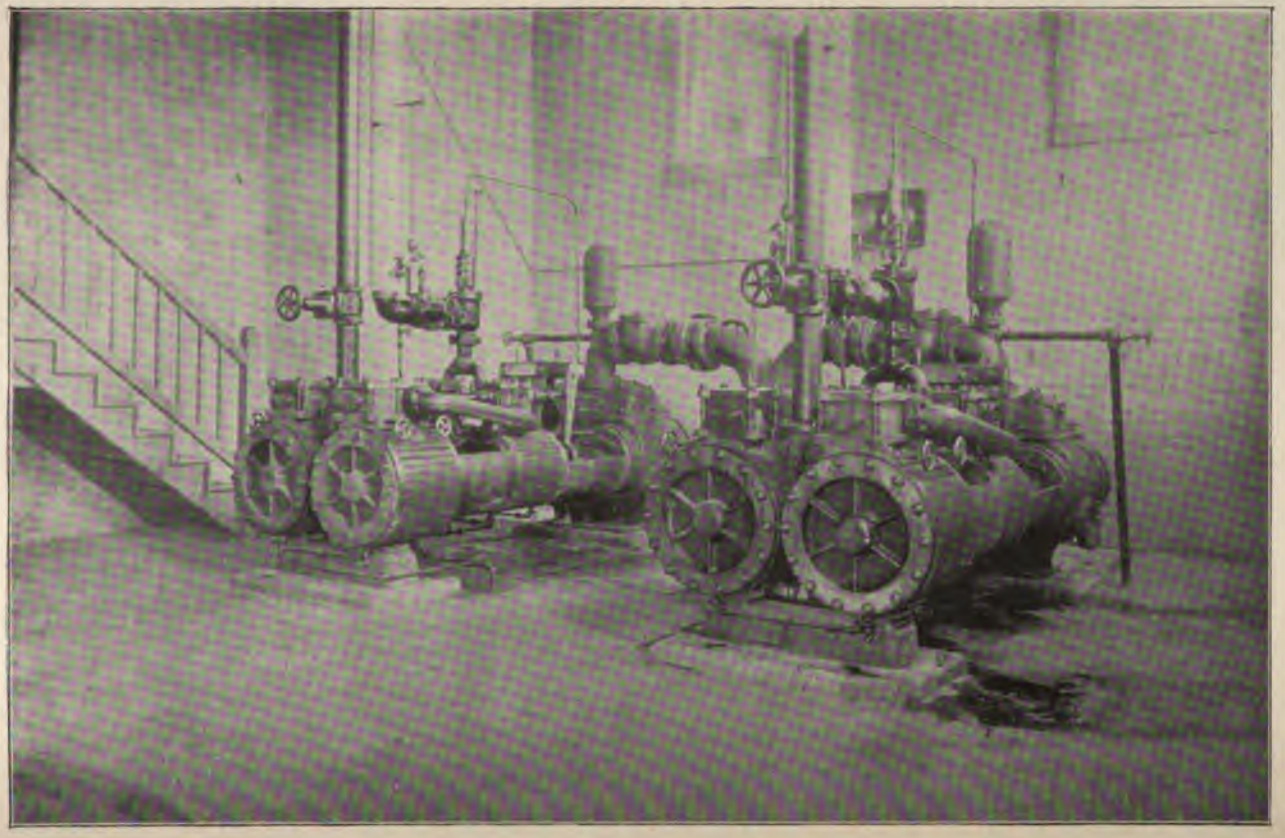
CURTIS C. HOWARD.

The safety of this water supply seems to be well assured. No record was available of the material and thickness, respectively, of the superincumbent strata, but the engineer informed me that the same was largely composed of impermeable clay. The water was found in gravel. How deep this gravel seam is, and composition and arrangement of the underlying material, is not known.

The locality has, in a sanitary as well as a picturesque sense, everything to commend it. The plant is in the broad valley of the Jerome-ville creek. The flow of the underground water has been ascertained to be in the direction of the pumping plant, and the well system can be extended up the valley as may be required. There are no villages above. Only two or three farm houses were observed on the edge of the valley, which is cut off from the village of Ashland by a ridge. There is no prospect of, or inducement to the settlement of the water-bearing area.

Contiguous to the pumping plant, and only a few rods from the nearest wells, flows Jeromeville creek. This is a small stream, largely fed by surface springs, which seem to be abundant in the vicinity. The flow was constant, the driest of seasons not diminishing it materially. This creek was thought of as a water supply, but was wisely abandoned. I was informed that a pipe inlet from the creek to the collecting well was proposed, to be used only for fire extinguishing purposes. It is to be hoped that the well water will be present in such quantity as to justify the authorities in dispensing entirely even with the construction of this proposed inlet.

CADIZ WATER WORKS—Showing discharge from Well No. 1.



CADIZ WATER WORKS—Pumping Machinery.

CADIZ WATER WORKS—Air-lift Pumping Machinery.

CADIZ WATER WORKS—View of Pumping Station from the hill.

CADIZ WATER WORKS—Rear view of Pumping Station.

CADIZ WATER WORKS—Discharge from Well No. 1.

Approval of the proposed plans and water supply of Ashland is respectfully recommended.

CADIZ WATER WORKS.

L. E. CHAPIN, CONSULTING ENGINEER,

CANTON, OHIO.

Cadiz is the county seat of Harrison county, Ohio, and is located on the hills some distance from streams of any size. A number of ravines originate within the town limits running in various directions, and carry the rainfall and town drainage away from the town, rendering a surface supply out of the question from lack of drainage area and contamination from local drainage.

In the fall of 1894, with a view to determine the possibility of obtaining a public water supply from drilled wells the mayor and town council drilled five wells in the west edge of the town. These wells were located within a short distance of each other, and are of the sizes, depths and elevations at the surface of the ground and at the level of the standing water in the wells as follows:

Well No.	Elevation surface ground at top of well.	Depth of well in feet.	Distance from surface to water in well.	Size of well. Inches.	Elevation of surface of standing water in well.
1	1,089.1	99.11	34.0	5⅝	1,055.1
3	1,093.8	206.0	32.50	5⅝	1,055.3
4	1,092.5	162 80	38.0	5⅝	1,054.5
5	1,101.2	110.10	46.0	5⅝	1,055.2
6	Not measured	.....	.....	.....	.....

Well No. 6 was not used by the town owing to its being in use as a supply for steam purposes for the electric light company's plant.

It will be seen from an inspection of the above table, notwithstanding the various locations of these wells, the elevation of standing water in each well is practically the same, showing that the supply all came from the same stratum, which stratum varies from clay, fire-clay, sand rock and limestone. The supply being found in the sand rock strata.

In order to ascertain the probable amount of water these wells would furnish, Nos. 1, 3, 5 and 6 were tested by means of an air-lift pumping outfit owned and operated by the Hall Steam Pump Co., of Pittsburg, Pa.

This test was not as complete as would be desired, owing to the many

changes and experiments necessary to determine the proper method of working the plant, but the general results showed that it was possible to obtain a supply of water approximating two hundred gallons per minute, and by drafting the water down in the wells from thirty-five to sixty feet, thus showing that in order to obtain this water it would be necessary to use either deep well pumping machinery or an air-lift pumping plant.

After some time was spent in perfecting the necessary legislation, the firm of Chapin & Clark, Consulting Engineers, was engaged by the council to prepare plans and specifications for a complete system of water works; and after due advertisement proposals were received on March 19, 1895, from contractors for furnishing material and performing work necessary for the construction of such plant. These proposals were from some fifty contractors for the whole or part of the work, and were duly considered by the council and the work let in two contracts; one for a complete plant of air-lift pumping machinery to The Knowles Steam Pump Works of New York City; and the other for the balance of the work being the water works system in itself to L. G. Hallock of Wheeling, W. Va.

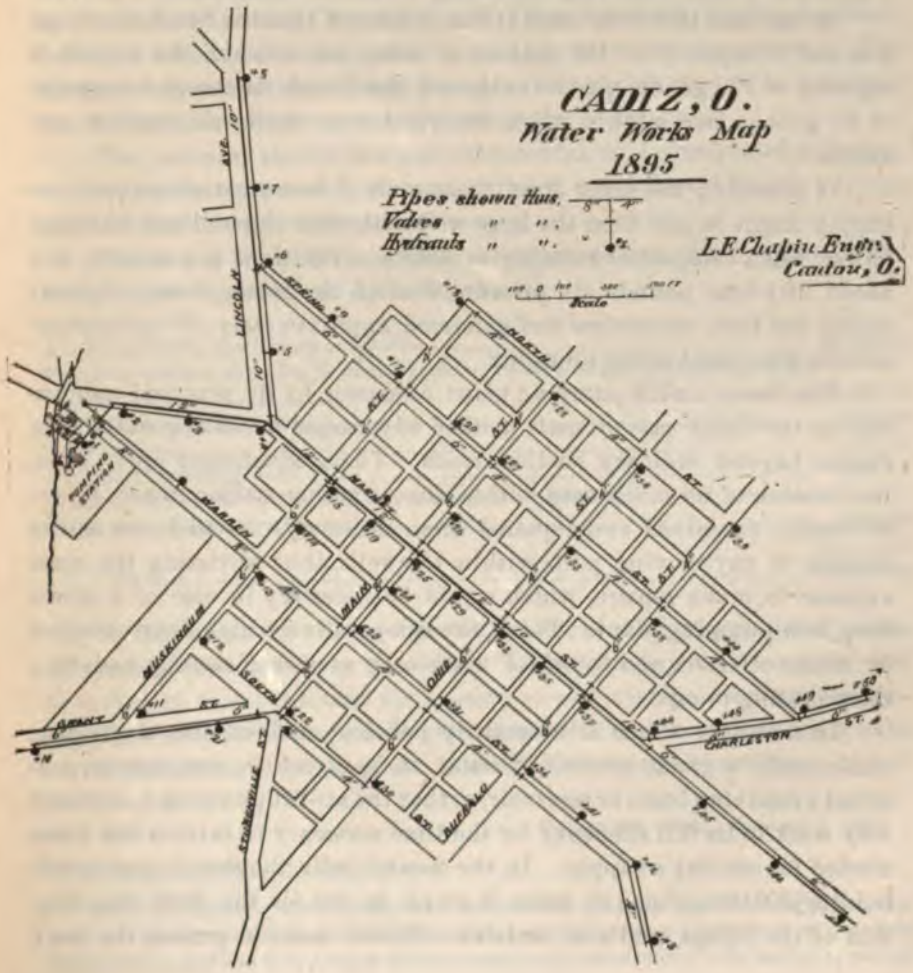
The Knowles Steam Pump Company's contract included the furnishing, erecting and piping complete of a Bacon air-lift pumping plant, consisting of two straight line Knowles air compressers and air receiver, piping of such wells as would furnish two hundred gallons of water per minute, with the necessary air and discharge pipes, the necessary foot pieces, valves and connections, the water to be discharged into effluent pipes constructed by the town, which effluent pipes deliver the water received by them into a masonry storage reservoir from which the supply for the town was to be taken.

Mr. Hallock's contract included constructing a covered storage reservoir, fifty feet in diameter and twenty feet in depth, built of brick, holding approximately 300,000 gallons of water; and pumping station divided into a pump room, boiler room and office room, and a brick stack seventy-one and one-half feet in height; also two three-quarter million gallons capacity Worthington, compound, non-condensing, direct acting pumping engines; two tubular boilers, each sixty inches in diameter and fourteen feet long, together with feed water heater, boiler feed pump, suction pipes to connect with the storage reservoir, discharge connections outside of building and all other appurtenances necessary in a complete pumping plant; also the pipe distribution laid complete including cast iron water pipe, special castings, valves, hydrants, valve boxes and pipe laying.

Construction was commenced at about the middle of April, and the entire plant completed and accepted on October 25, 1895.

As the season of 1895 was an extraordinary dry one and water from drilled wells being generally scant throughout the country, it was feared that the four wells above mentioned might not furnish the necessary amount of water; accordingly well No. 2 was drilled to a depth of 212 feet and cased with 7⅝-inch casing, and wells Nos. 1, 3, 4 and 5 were all drilled deeper to a uniform depth of about 212 feet from the surface.

The Bacon air-lift pumping plant was first set up in a temporary location and all wells except No. 5 were tested by themselves separately and together, to determine the quantity of water each well would furnish, and the size of piping best adapted to such quantity of water, and for the compressed air necessary to lift it and discharge it into the storage reservoir. These tests showed that all the supply the stratum would furnish could be had by pumping from wells Nos. 1, 2 and 3.



Accordingly these wells were piped up and fitted with the Bacon air-lift pumping device. This device consists in a head piece resting upon the top of the well casing, into the center of this head piece is connected the water discharge pipe and also the air pipe which encircles the discharge pipe. A suitable connection or foot piece being made at the bottom to supply the air into the bottom of the discharge pipe. The size and lengths of these pipes are as follows: Well No. 1, 204 feet 3 inches of 4¼-inch inserted joint casing for air line, 202 feet and 7 inches of 2¾-inch inserted joint casing for discharge line. Well No. 2, 204 feet and 5 inches of 4¼-inch inserted joint casing for air line, 52 feet and 11 inches of 2¾-inch and 150 feet of 3-inch, being a total of 202 feet and 11 inches of inserted joint casing for discharge line. Well No. 3, 199 feet and 11 inches of 3¾-inch inserted joint casing for the air line, 178 feet and 8 inches of 2-inch inserted joint casing for the discharge line.

In the tests that were made it was developed that the 3-inch discharge line had a capacity of 152 gallons of water per minute, the 2¾-inch a capacity of 126 gallons per minute, and the 2-inch discharge a capacity of 65 gallons per minute, when the yield from each well was free and ample.

In pumping the water from these wells it was ascertained that the supply might be had from the large well with least expenditure of steam power, when compressor running at ninety revolutions per minute and about fifty-four pounds air pressure, drafted the water down at about eighty feet from the surface and delivered approximately 150 gallons per minute after eight hours pumping.

The Bacon air-lift pumping plant as shown by its practical application in the Cadiz case presents marked advantages for lifting water from depths beyond ordinary suction reach. These advantages are: First, the location of all machinery within the pumping station, where it can be readily examined and repaired when necessary. Second, the entire absence of any moving parts within the wells, thus obviating the great expense to make repairs, which would be necessary in case of a direct deep well pumping plant. Third, the comparatively high duty obtained by means of crank and fly-wheel machinery over that usually had by a reciprocating pump.

In a supply which is necessarily deficient or incapable of yielding uniformally a given amount of water, it is, of course, necessary to construct a receiving basin or reservoir, so that the air-lift pumping machinery may work to its full efficiency for the time necessary to furnish the water needed for one day's supply. In the case of Cadiz, the receiving reservoir holding 300,000 gallons of water, is ample in size for the daily consumption of the village, and also contains sufficient water to protect the town

against any sudden demand for large amounts of water within short times for fire protection.

The pipe distribution of Cadiz contains pipe of rather above the average sizes for a village of its population; ample size of street mains being desired by the village authorities. The distribution is as follows: Four-inch pipe, 8,690 feet; six-inch pipe, 8,866 feet; eight-inch pipe, 2,533 feet; ten-inch pipe, 2,480 feet; twelve-inch pipe, 2,401 feet, or about four and three quarters miles not including suction connections and piping from the supply wells to the storage reservoir; also 482.97 tons of cast iron water pipe, and 12.47 tons of cast iron special castings; also three twelve-inch valves, four ten-inch valves, two eight-inch valves, nineteen six-inch valves, and fifteen four-inch valves; also fifty hydrants, each having five-inch diameter of standpipe and provided with two and one-half-inch hose nozzles; twenty-five of these hydrants having four-inch bell connections, and twenty-five having six-inch bell connections. The six-inch bell connections being placed on the higher ground to minimize the friction loss of water passing through the hydrants.

The pumping station is a neat ornamental, well constructed building, no expense being spared to secure a building well adapted for the purpose and substantial and roomy in every way.

The cost of the plant including all expenses from the inception to the completion is approximately as follows:

Air-lift pumping machinery complete	$2,563.00
Pumping station, pumping machinery, storage reservoir and distribution complete	27,029.90
Engineering and inspecting	1,348.75
Land expenses	1,921.53
Drilling and testing wells	2,551.74
Printing bonds, cost of election, advertising, contingent and general expenses and council investigating trips	2,058.36
Total	$37,473.28

In this plant the village of Cadiz has one of the best completed plants of water works existing in the State of Ohio, and they are among the first to make the direct practical application of the principal of air-lift pumping machinery for lifting water from deep wells, and in their opinion have solved the problem in a manner most satisfactory to themselves.

COLUMBUS, OHIO, *January* 7, 1895.

To the Mayor and Council, Cadiz, Ohio:

SIR: An investigation having been made of the proposed public water supply for your village, to be obtained from deep wells near the present location of the electric light station, and the said supply having been found satisfactory, it is hereby approved

in accordance with the provisions of an act amending the act to create and establish a State Board of Health, passed March 14, 1893.

I have the honor to be,

Very respectfully,

C. O. PROBST, *Secretary.*

AN INVESTIGATION OF THE PROPOSED WATER SUPPLY OF CANAL DOVER.

BY C. O. PROBST, M. D., AND JOSIAH HARTZELL, PH. D.

Application having been duly made to approve the water supply proposed for the village of Canal Dover, the president appointed Mr. Hartzell and your secretary to make the necessary investigation.

We visited Canal Dover, February 28. Mr. Hostetler, the Mayor, Mr. Chapin, Consulting Engineer, and members of council, showed us three different locations where it had been proposed to obtain water by driven wells. A test well had been bored at the most favorable site, and a sample of water was collected for chemical examination.

The following report was made to the authorities of Canal Dover:

OHIO STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY, COLUMBUS, O., *March* 8, 1895.

Messrs. J. H. Hostetler, Mayor, and L. E. Chapin, Consulting Engineer, Canal Dover, O.:

DEAR SIRS: At your request, the State Board of Health has caused an examination to be made of the proposed source of water supply for the village of Canal Dover.

We were shown three sites where it is proposed to obtain water by driven wells located in water bearing sand and gravel. Two of these sites cannot be recommended owing to their proximity to cemeteries.

The other site is immediately north of Wooster street, on the east side of the river. A sample of water collected from a test well at this location was submitted to Prof. C. C. Howard, of Columbus, O., who reported as follows:

COLUMBUS, O., *March* 4, 1895.

DR. C. O. PROBST, *Secretary State Board of Health:*

DEAR SIR: I have made a sanitary analysis of the sample of water received from Canal Dover with the following results:

Parts per 100,000.

Oxygen required.	Free ammmonia.	Albuminoid ammonia.	Organic ammonia.	Nitrous acid.	Nitric acid.	Chlorine	Total solids.
.26	.011	.017	.024	.001	.012	.20	28.6

In this sample the oxygen required is higher than will be found in a water of the best quality, in fact so high as to indicate a larger amount of organic matter than is desirable. The free ammonia is decidedly higher than is permissible in a surface water, and must be regarded as indicating the presence of decomposing nitrogenous matter in

quantity that will not be found in a good water. The albuminoid ammonia, representing that part of the nitrogen of albuminoid substances which is converted into ammonia by the action of a boiling, alkaline premagnate solution, is about two-thirds of the organic ammonia, which contains *all* the nitrogen present in these albuminoids, a fraction frequently found, and which furnishes a valuable check on this important factor. These agree in being so high in amount, especially when taken in connection with the high free ammonia, that the conclusion cannot be avoided that there is more nitrogenous substances in the water than is desirable. From the small quantity of nitrous and nitric acids, it is learned that the contamination is of recent rather than remote occurrence, and the exceptionally low chlorine indicates that animal excreta do not constitute the contaminating material present. The water was quite muddy when received and even after standing two days its perfect clearness is impaired by a very fine deposit. This would naturally be supposed to be entirely inorganic in composition but it has been my experience that waters containing a similar fine deposit are usually found to contain larger quantities of organic matter than would be expected from their origin. Consequently, I am inclined to suspect that a water from this same source that was quite free from the deposit would make a better showing than does this water. If this suspicion is erroneous and the clear water is of the quality of this sample, it would seem that a search should be made for a water of better quality.

Very respectfully,

CURTIS C. HOWARD.

The examination does not indicate the water to be of first class quality. The chemist suggests that a sample collected under more favorable conditions might give a better showing, and the geology and surroundings seem to indicate that an abundant supply of fairly pure water might be obtained at this point.

There are, however, some objections to this site. The water you will obtain is upper ground water with no protective cover above it. At the present time it is found within less than ten feet from the surface, and unless the territory for a considerable distance around the wells can be kept free from all impurities, the supply would be liable to contamination.

You propose to reserve two acres for water works purposes. The land adjacent to these two acres has been platted, and one house is being erected upon it. There is some probability that eventually many houses will be built in this neighborhood, in which case you would hardly be able to prevent privy vault and other forms of soil contamination which would endanger the water supply.

In view of this possible future contamination of wells located at this point we are of the opinion that it would be advisable to put down a test well on land farther up and on the same side of the river. There is every reason to suppose that the water here will be of fully as good quality, if not better, than at the place where the test well has been located, and this site offers the advantage of being much less exposed to future contamination.

We would suggest that it would be advisable to locate the wells at a greater distance from the river than the test well we examined, to avoid

the possibility of the wells drawing water from the river. It has been suggested that a deep water supply might be obtained which would be less liable to contamination, and perhaps softer. There would not, in our opinion, be any great advantage in obtaining water from the sand rock underlying the thick beds of sand and gravel found in your valley. As there is no impervious soil stratum between the sand stone and the surface, the water it contains is mostly water which has percolated down to it from the surface. It is doubtful if it would be much, if any, purer than water in the sand and gravel above, and in all probability would have acquired a higher degree of hardness in its passage through the sand and gravel to the rock.

A second sample of water was sent March 21. According to Mr. Chapin, Consulting Engineer, this was taken from a test well located about 1,200 feet north of the test well previously mentioned, and about 300 feet from the river.

The chemist made the following report on the sample of water:

COLUMBUS, OHIO, *March* 22, 1895.

DR. C. O. PROBST, *Secretary of State Board of Health:*

DEAR SIR: I have made a sanitary analysis of a second sample of water received from Canal Dover yesterday with the following results:

Parts per 100,000.

Oxygen required.	Free ammonia.	Albuminoid ammonia.	Organic ammonia.	Nitrous acid.	Nitric acid.	Chlorine	Total solids.
.11	.004	.005	.008	trace	.016	.24	27.0

A comparison of these numbers with those obtained for the first sample and reported March 4, shows a considerable similarity in the nitrous and nitric acids, chlorine and total solids. The first two numbers indicate that the water has not been contaminated in the past, the chlorine indicates the absence of pollution by animal excreta, and the last number shows that the water is not a very hard one. In these respects this sample somewhat resembles the first sample sent. In the oxygen required, free, albuminoid and organic ammonias, there is a decided difference in favor of this sample. While the free ammonia might be a trifle lower, the other three factors are so low as to indicate only about the minimum quantity. While obliged to express an unfavorable opinion as to the quality of the first sample, a favorable judgment must be returned for this sample. As far as its chemical composition goes, and that is all this report professes to consider, it is quite a clean water.

Yours truly,

CURTIS C. HOWARD.

COLUMBUS, OHIO, *March* 29, 1895.

MR. J. A. HOSTETLER, *Mayor, Canal Dover, Ohio:*

DEAR SIR: The State Board of Health has considered your application to approve a water supply for Canal Dover. The supply to be taken from driven wells in the neighborhood of the test well No. 2, the well from which the sample of water was last furnished for examination, has been approved by the Board.

C. O. PROBST, *Secretary.*

REPORT ON PROPOSED WATER SUPPLY FOR CELINA.

BY R. D. KAHLE, M. D.

I visited Celina on the 22d of March and inspected their proposed water supply. They propose to get their water supply from deep wells. A test well has been drilled. It is located about one-fourth of a mile north and west of town. The slope of the land is away from the well and toward the city. The well is six inches in diameter and 180 feet deep. Rock is reached at eighty feet, and it has been cased ninety-six feet. The capacity of the well is large, no exact measure of its capacity has been made, but it is estimated by the trustees and engineer that four wells will be capable of supplying the city. These wells will probably be drilled within a radius of seventy-five feet. They will be connected with two pumps having a capacity of 500,000 gallons per day each.

There will be about ten miles of mains through the principal streets.

The following is the chemical analysis of the water as made by Prof. Howard:

COLUMBUS, OHIO, *March* 25, 1895.

DR. C. O. PROBST, *Secretary of the State Board of Health:*

DEAR SIR: I have made a sanitary analysis of the water received from Celina with the following results:

Parts per 100,000.

Oxygen required.	Free ammonia.	Albuminoid ammonia.	Organic ammonia.	Nitrous acid.	Nitric acid.	Chlorine	Total solids.
.20	.092	.007	.012	none	.006	1.48	251.0

The very high free ammonia in this water is noteworthy, and if found in a surface or shallow well water could hardly indicate anything but a large quantity of albuminoid matter in a state of decomposition. A consideration of the low albuminoid and organic ammonias as well as the absence of nitrites and almost complete absence of nitrates, with low chlorine and very high solids, causes us to regard it as quite a typical deep well water, and the large quantity of free ammonia entirely loses its usual significance. The oxygen required is indeed somewhat higher than is usually found in a water of the best quality, but is doubtless due to a trace of ferrous salts and is not that used in the oxidation of organic matter. The worst feature about the water is its extreme hardness which will render it much less desirable than a softer water would be; but as far as its organic purity is concerned the water is practically free from organic matter.

Yours truly,

CURTIS C. HOWARD.

It will be seen that the water is very hard, about 150 grains per gallon, but from a sanitary standpoint it is not objectionable as it is free from organic matter, and I recommend its approval.

COLUMBUS, O., *April* 2, 1895.

MR. J. L. LEBLOND, *President, Water Works Trustees, Celina, Ohio:*

SIR: The State Board of Health has considered your application to approve the proposed water supply of your village, to be obtained from a number of deep drilled wells, and the same is hereby approved.

C. O. PROBST, *Secretary.*

LETTER OF DISAPPROVAL OF THE PROPOSED WATER SUPPLY FOR COLUMBUS.

COLUMBUS, O., *March* 30, 1895.

MR. A. H. MCALPINE, *Superintendent of Water Works, Columbus, Ohio:*

DEAR SIR: The State Board of Health has considered the application of the city of Columbus for approval of a dam which it is proposed to build across the Scioto river, about four feet high and immediately below the present intake, for the purpose of obtaining unfiltered water from the Scioto river. The object of the dam is to allow a more convenient intake, and to provide a small reservoir to balance hourly fluctations in consumption, and to provide a reserve for use in case of extensive conflagrations. After a careful examination of the ground, in company with our engineer, and after considering the nature of the water shed of the Scioto river, and the population upon it, we are of the opinion that the water of the Scioto river is not suitable in quality for a public water supply; and we hereby disapprove of the construction of the proposed dam as a means of supplying unfiltered water from the river. We recognize, however, the pressing necessity of securing additional water, and we would recommend that the Columbus authorities should proceed at once to investigate and secure additional ground water in the vicinity of the present West Side pumping station and filtering gallery, where the conditions appear favorable for securing a considerable additional supply. The location of these wells must be approved by the Board.

We would further recommend, as an additional precaution, in case the yield from the wells should not equal the requirements of the city, that sand filters should be built immediately below the site of the proposed dam, or at some equally convenient location, and that the water drawn from the river should be filtered through such filters, the detailed designs of which to be submitted to and approved by the Board.

The water must be filtered at a rate not to exceed 2,500,000 gallons per acre daily. In connection with these filters the proposed dam may be built as a suitable and appropriate means of facilitating the bringing of an ample quantity of water through the filters, provided it is agreed that these filters shall be in operation within one year from the time work is commenced on the dam. As there is a possibility that drainage from the Columbus Hospital for the Insane at times reaches the river above the site of the proposed dam, which could easily be remedied, such changes should be made as will prevent this. The location of the abattoir of that institution should also be changed.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON THE PROPOSED WATER SUPPLY OF COLUMBIANA.

BY JOSIAH HARTZELL, PH. D.

To the State Board of Health:

GENTLEMEN: The construction of public water works, to cost not over $30,000, was authorized by a vote of the people in the fall of 1894. The legislative requirements have been completed, and the plan of the work is so far matured that, with the approval of the State Board of Health once obtained, the system can be placed under contract. By appointment of President Stanton, I visited Columbiana March 6.

Messrs. A. C. Bell, Mayor, W. H. Baker and Frank Bell, councilmen, and E. L. Roninger, Clerk, facilitated the purpose of my visit.

The population is about 1,400. The village site is a mound with apex near the middle, and sloping gently in all directions. The soil depth is generally about twenty-two feet; thence downward through sand and rock of unknown thickness. The plan proposes service pipe of ten, eight, six and four inch diameters, being through six miles of streets. There will be fifty fire hydrants—pressure to be obtained from a standpipe about 100 feet high, and located at a point near the highest level of the town site.

It is proposed to obtain the water from wells south-west of the village at a point which has the convenience of a railroad switch. The proximity of the well to the inhabitated area would justify the condemnation of this source of supply if the water were of surface origin. This test well, after passing through the twenty-two feet of alluvium, is bored fifty feet, first through a seam, about one foot in thickness, of soapstone shale, and the balance of the way through solid sandstone rock. The seams of the latter are generally horizontal. The well is cased through the twenty-two feet of ground with eight-inch casing, the joint at lower end connecting with the rock being water tight, and the casing from that point to the bottom of the well, seventy-two feet from the surface, is six inches in diameter.

The water level in this well remains four feet below the surface of the ground. Constant pumping fifty-three hours at the rate of fifty-two gallons per minute had no effect in reducing the level. It is proposed to bore other wells a few rods distant as soon as it is found that the quality of the water offers no obstacles to its use. A sample of the water taken from the last obtained by the pumping test above referred to was analyzed by Prof. C. C. Howard, with the following results:

COLUMBUS, OHIO, *May* 7, 1895.

DR. C. O. PROBST, *Secretary State Board of Health:*

DEAR SIR: I have made sanitary analyses of the two samples of water received from Columbiana, O., with the following results:

The first sample (1) received, April 6, was rather higher in nitrates, recorded as nitric acid, than is usually found in a water of good quality, and as it had been standing some weeks, there was a question as to what extent the nitrates might have resulted from the oxidation of the nitrogen in organic combination in the water, those constituents which indicate a recent decomposition of organic matters being quite low. For the same reason it was thought desirable to examine a fresh sample of the water before expressing an opinion as to its quality. The second sample (2), received May 4, has just been examined and the figures for the two samples are given below, expressed in parts per 100,000:

	Oxygen required.	Free ammonia.	Albuminoid ammonia.	Organic ammonia.	Nitrous acid.	Nitric acid.	Chlorine.	Total solids.
(1).	.07	.001	.004	.006	none	.984	3.16	49.7
(2).	.07	.001	.003	.006	none	.804	3.16	48.6

These figures show that the two samples are from the same source. The first five constituents are quite low and entitle the water to be regarded as quite free from organic matter. The nitric acid in both samples is considerably higher than is usually found, and suggests that the water at some past time may have been exposed to contamination. If so, is there any fear of the recurrence of these conditions? The chlorine in a shallow well water would suggest contamination with animal excreta, but in a deep well water, one would hardly be justified in attaching much importance to this. The second examination has shown that the nitrogen has not changed from the state of organic combination to nitrates since the water was drawn, and there is no objection to the water on this score. The figures indicating the presence of organic matter either in a fresh state or in one of decomposition, are all so low, that, notwithstanding the quantity of nitrates, and the fact that considerable importance is attached to these as indicating exposure to pollution at a past period, if a survey of the source of the water indicates no chance of contamination, the water may be accepted as of satisfactory quality.

Yours truly,

CURTIS C. HOWARD.

In view of the quality of this water, and of the manner in which it is protected from present and future contamination, it is recommended that the plan of the Columbiana water supply be approved.

Before closing this report it may not be amiss to make reference to certain peculiarities in hygienic methods which characterize the village of Columbiana. Privy vaults are not allowed. All depressions in the surface for the reception of feces were cleaned out and filled up with clean earth years ago, by the householder himself, or by the health officer at the former's expense. Deodorization, removal when needed, cleanliness and thoroughness characterize the entire work.

The water heretofore has been obtained from wells reaching to the rock, sometimes penetrating it a few feet. Since the adoption of the above precautions the water has been good and the health has been good. Indeed, but for the need of fire protection, water works were not regarded as necessary. Water closets in houses will not be permitted until sewers are constructed, and it is not expected that a sewer system will be undertaken for the present. There are already two pipe sewers of considerable length into which only kitchen wastes and the drainage of cellars is admitted. As there is no stream or body of water of any consequence near the village, the plan of disposal by irrigation, and the example of Oberlin, was recommended to the attention of the authorities at such time as sewerage is undertaken.

COLUMBUS, OHIO, *May* 8, 1895.

To the Mayor and Council, Columbiana, Ohio:

DEAR SIRS: The State Board of Health has caused an examination to be made of the proposed water supply of your village.

I have the honor to transmit herewith a copy of the report of Mr. Josiah Hartzell to the Board, recommending the approval of the proposed supply.

Very respectfully,

C. O. PROBST, *Secretary.*

COLUMBUS, OHIO, *June* 24, 1895.

MR. A. C. BELL, *Mayor, Columbiana, Ohio:*

DEAR SIR: At a meeting of the State Board of Health held in Toledo, June 19, 1895, the report on the proposed water supply for Columbiana was approved.

I enclose herewith a copy of the report.

Yours truly,

C. O. PROBST, *Secretary.*

LETTER OF APPROVAL OF WATER SUPPLY OF DALTON.

MR. W. H. HOUGHTON, *Secretary of Water Works Committee, Dalton, Ohio:*

DEAR SIR: At a meeting of the Ohio State Board of Health, held in Columbus, January 23, 1895, the water supply proposed for your village was approved, as regards *quality.*

It is advised that you determine the question of *quantity* before making extensive improvements. The following is a copy of the chemical examination.

COLUMBUS, OHIO, *December* 4, 1895.

DR. C. O. PROBST, *Secretary of the State Board of Health:*

DEAR SIR: The two samples of water received from Dalton have been analyzed by myself with the following results.

Sample No. 1 from well near mill.

Sample No. 2 from well on hill at Cooks.

Parts per 100,000.

No.	Oxygen required.	Free ammonia	Albuminoid ammonia.	Organic ammonia.	Nitrous acid.	Nitric acid.	Chlorine.	Total solids.
1	.09	.020	.003	.008	trace.	.005	1.00	48.6
2	.08	.003	.001	.006	trace.	.005	1.24	65.2

The difference in the amount of the total solids in the two samples would indicate that they are from a different source. With the exception of the free ammonia which is decidedly higher in 1 than in 2, there is not a great difference in the character of the two waters. The "organic ammonia" contains all the nitrogen existing in organic combination and not the fractional and uncertain portion expressed as albuminoid ammonia. This is determined by the method of Kjeldahl, as proposed by Blair. As the ammonia yielded by this method would be low for even the albuminoid ammonia process, and is known to contain all the nitrogen, there is a gratifying feeling of certainty that the nitrogenous matter in these samples is quite small, and consequently the contamination is slight. This factor as well as the small quantity of oxygen required, nitrous and nitric acids in 1 would indicate that the free ammonia is not derived from the decay of nitrogenous matters but rather from the reduction of nitrates. Both waters must be regarded as containing very little organic matter.

Yours truly, CURTIS C. HOWARD.

Respectfully, C. O. PROBST, *Secretary.*

REPORT ON PROPOSED ADDITIONAL WATER SUPPLY FOR FOSTORIA.

BY C. O. PROBST, M. D., SECRETARY.

Application having been made by the superintendent of water works for approval of an additional water supply for Fostoria, I visited that city August 10, and inspected the proposed supply.

I found that fears were entertained of a water famine. The storage reservoir, which has a capacity of 120 million gallons, was reduced to an estimated supply of less than two million gallons, or a little more than three weeks supply, reserving sufficient for fire protection.

It is proposed to temporarily make use of two sources of additional supply. The first, and most important, is from a limestone quarry. This quarry is just outside the corporation. It has been excavated to a depth of about fifty feet. There are two overflowing wells in the bottom of the quarry, one about 160 feet, the other 200 feet deep, counting from the bottom of the quarry. At one side of the quarry there is a hole twenty feet deeper than the general level. Water is pumped daily from this hole to permit working the quarry. It is estimated that about 200,000 gallons can be pumped from it daily.

The only visible source of pollution of this supply is from a manure pile on a road along one of the banks. This could easily be removed and the dumping of manure at this place temporarily stopped.

The supply of water failed last summer and water was taken from this quarry without any known injurious effect. There was a considerable growth of vegetation in the bottom of the quarry, and it was deemed unfair to chemically examine the water as I found it. It was agreed to pump the quarry dry, thoroughly clean the bottom, and then furnish a sample of water for examination, collected by the health officer. This officer I know well, and he can be depended upon to furnish a fair sample of water for analysis.

The other supply proposed is from a drilled well on the water works grounds. It is a six-inch drilled well about 165 feet deep into rock. The surroundings are good and there are no visible sources of pollution. It is estimated that the well will furnish 75,000 to 100,000 gallons daily. It is proposed to put down other wells if this one proves satisfactory.

Arrangements have been made to test the amount of flow by an air pump. Samples will then be furnished for examination.

As conditions threaten to become serious at Fostoria unless copious rains should come soon, I desire to recommend that the sources proposed for additional supplies be approved for a temporary supply, provided subsequent chemical examination of the water proves satisfactory. And provided further that the manure spoken of at the quarry be removed and none be permitted to be placed there while water is being taken from the quarry.

REPORT ON THE PROPOSED WATER SUPPLY FOR LEBANON.

BY BYRON STANTON, M. D.

To the State Board of Health:

GENTLEMEN: In response to a telegram from John W. Hill, Consulting Engineer, stating that the Council of Lebanon, Ohio, desired an inspection by the State Board of Health of a proposed water supply, I visited that place on July 3, 1895, and submit the following report:

A number of test wells have been drilled to a depth of from ninety-three to one hundred feet. One of these is known as the Glosser well. Three others on the property of Mr. Braden, are near together and are known as the Braden wells. These are about a quarter of a mile south of the town. They are cased with iron pipe to a stratum of water-bearing sand beneath alternating strata of clay and dry sand, the strata of clay measuring, from above downward, five, twenty and thirteen feet respectively, the strata of sand, ten, five, six and thirty feet. The top soil and shale make the rest of the depth. The lower of the Braden wells is a flowing well and in the others the water rises to within about a foot of the surface.

Analysis of the water from the Braden wells shows it to be superior to the Glosser well, and the Braden farm has been chosen as the proposed source of water. It is proposed to sink five or six wells of six inches in diameter, to be cased to the water-bearing sand, which is found at a depth of about ninety-three to ninety-eight feet. From these the water is to be collected in a cistern from which it is to be pumped to the stand pipe.

Analysis of the water from the Glosser well was made by Dr. W. Simonson and Henry C. Hill, of Cincinnati, but the result is here omitted for the reason that, compared with the Braden well, it was much inferior. A sample of water from the Braden well, collected by Mr. J. W. Hill, was analyzed by Dr. Simonson and H. C. Hill, and one taken by Councilman Monroe was analyzed by Prof. C. C. Howard, of Columbus, Ohio. The results differ but little in regard to the more important features and are as follows:

Parts per 100,000.	Howard.	Simonson.
Oxygen required	.11	
Free ammonia	.030	.017
Albuminoid ammonia	.002	.0003
Organic ammonia	.004	
Nitrous acid		
Nitric acid		
Chlorine	.68	2.
Temporary hardness	32 9	33.8
Permanent hardness	5.5	1.7
Total hardness	38.4	35.5
Total solid parts	43 6	40.53

Iron as ferrous carbonate, amount not stated.

These figures show this to be a water of as high degree of purity as can be found in this section of the State, the most undesirable feature being its hardness and the presence of an amount of iron in such quantity, Prof. Howard thinks, that it may cause some inconvenience. The constituents that indicate the presence of organic matter either in a state of decomposition or after decomposition has been completed are low with the exception of free ammonia, which in a shallow well water would be regarded as suspicious, but in a deep well water so free from other evidences of contamination must be regarded as arising from the reduction of nitrates.

The character of the water, the depth of the wells and the nature of the superjacent strata are such that I do not hesitate to recommend the approval by the State Board of Health of the Braden wells as a source of water for Lebanon.

COLUMBUS, OHIO, *July* 8, 1895.

To the Mayor and Council, Lebanon, Ohio:

DEAR SIRS: Dr. Byron Stanton, President of the State Board of Health, has reported upon his examination of the proposed water supply for Lebanon. His report is favorable, and he recommends "The approval by the State Board of Health of the Braden wells as a source of water supply for Lebanon."

The report will be formally approved at the next regular meeting of the Board, which will not occur until October, but you will be justified in going on with your work under this recommendation.

Yours truly,

C. O. PROBST, *Secretary.*

REPORT ON PROPOSED WATER SUPPLY AND SEWERAGE FOR LOGAN.

THOS. C. HOOVER, M. D., AND C. O. PROBST, M. D.

The above committee was appointed to investigate the proposed water supply and sewerage system for Logan, application for approval of plans having been duly made.

We first desire to commend the wisdom of the authorities of Logan in deciding to introduce sewerage and a public water supply at the same time. From a sanitary standpoint it is always desirable that these improvements should go hand in hand.

Complete plans for the sewerage system have not been made; but it is proposed to arrange for sewering the entire city, as soon as possible, and the separate system, with all the modern improvements, has been adopted.

The outlet is into the Hocking river, at a point below and remote from the city, and outside the corporation limits. The river was near its

minimum flow at the time of our inspection, and affords a sufficient amount of water, in our judgment, to carry off the sewage for some years without offense. Suitable land in the vicinity of the outlet can be procured for purifying the sewage by filtration or precipitation; though in either case pumping will be necessary. Athens is the only town of any size on the Hocking river below Logan. Athens recently put in water works, the supply being taken from a large well.

The Asylum for Insane at Athens, until recently, has obtained its water supply from a large well near the Hocking river. About a year ago direct connection was made with the river. I have just been informed that the pipe is closed, but that repairs would be made at once. This water is, to a limited extent, used for drinking purposes, but the main supply is obtained from a large spring, which could easily supply all the water needed for this purpose.

We would therefore recommend that the proposed outlet for the sewerage system of Logan be approved, subject to the condition that the city of Logan agrees to purify its sewage in a manner satisfactory to the State Board of Health, at the end of five years from the date of the first use of the sewer outlet.

WATER SUPPLY.

It is proposed to obtain a water supply by putting in a large infiltration well on bottom land a hundred feet or more from the Hocking river, and on the side opposite to the city. The soil is sand and gravel for thirty-two feet. The well is to be from twenty five to thirty feet deep and twenty-five feet in diameter. Just above the proposed site of the well the hills approach the river closely, but recede immediately below leaving a valley joining the river at right angles. There appears to be a sufficient water shed to furnish the desired quantity of water, but we would recommend that this question be determined by proper tests before putting in a permanent well.

The bottom on which it is proposed to locate the well is subject to overflow by the Hocking river. It will be necessary to build up the wall of the well two or three feet to prevent flood water entering it.

About twenty-five miles above Logan, on the Hocking river, is Lancaster, a growing city of 7,555 inhabitants. Lancaster has a partial sewerage system with an outlet indirectly into the river, and in the near future will doubtless put in a complete sewerage system. Sewage polluted water may thus, in time of flood, flow around and filter into the proposed well for Logan. As Lancaster can be compelled to purify her sewage, when a complete system is introduced, the danger of pollution of

the Logan well from this source is, we believe, very slight. Even this slight danger could be avoided, if considered necessary, by placing the well farther from the river, on higher land, out of reach of flood waters. It is possible that a less quantity of water would be found there.

The city proposes to buy about one acre of ground for water works purposes. The surrounding land is a cultivated field. Although it has not been necessary in the past to manure this land, on account of its enrichment by the river's overflow, there is nothing to prevent the owner depositing manure on the field near enough to the well to possibly endanger it.

It is probable that the growth of the city will require a larger supply than the yield of this well, which will collect but a small part of the ground water in its vicinity. We would therefore recommend that more land be purchased, if the well is to be used.

Samples of water from two test wells were collected and have been examined by Prof. Howard with the following result:

June 5, 1895.

DR. C. O. PROBST, *Secretary of State Board of Health:*

DEAR SIR: I have made a sanitary analysis of the two samples of water received from Logan, O., with the following results:

No. 1, west well. No. 2, east well.

Parts per 100,000.

	Oxygen required.	Free ammonia.	Albuminoid ammonia.	Organic ammonia.	Nitrous acid.	Nitric acid.	Chlorine.	Total solids.
No. 1.	.10	.016	.005	.008	trace.	.004	.72	36.2
No. 2.	.09	.026	.006	.010	trace.	trace.	.28	36.0

	Temporary hardness.	Permanent hardness.
No. 1.	31.8	2.4
No. 2.	28.5	2.8

It will be noted that all of the above constituents are so low as to entitle the water to a favorable opinion, except the free ammonia. This is a common occurrence in a deep well water, and were these samples from deep wells no attention would be paid to it. But as it is stated that the depth of these wells is but about twenty-five feet, the question arises whether the water is from strata of such depth that the water is practically a deep well water. If so, the water is entitled to a clean bill for reasons given above. If, however, the water is what may be called a surface water, derived from shallow strata, more attention would have to be paid to the high free ammonia. But in waters where the free ammonia is derived from the decomposition of proteid matter, the other constituents, as oxygen required, albuminoid and organic ammonias, and frequently nitrites, will be found markedly higher. The almost complete absence of nitrates furnishes good evidence that the water has not been exposed in its past history to decaying nitrogenous or proteid matter. From these data alone and without further knowledge of the source or history of these samples, I am inclined to believe that they have not been exposed either recently or remotely to pollution, and that this water really partakes of the character of a deep well water. However, I would call attention to the importance of a rigid examination of all facts that will throw any light on the possibility

of exposure to contamination, and I should be glad to have this opinion either corroborated or overthrown by facts that may be discovered. The case is an interesting one and worth following up.

Yours truly,

CURTIS C. HOWARD.

This not being entirely satisfactory, it was thought possible that examination of samples collected after continued pumping would give better results. Accordingly a second set of samples was collected and examined by Prof. Howard, who reports as follows:

COLUMBUS, OHIO, *June* 13, 1895.

DR. C. O. PROBST, *Secretary of State Board of Health:*

DEAR SIR. I have made a determination of the following constituents in the samples of water received yesterday from Logan with the following results: The numbers obtained in the examination of June 5, are given in the parentheses following.

Parts per 100,000.

	Oxygen required.	Free ammonia.	Albuminoid ammonia.	Chlorine.
No. 1. (East)	.09 (.09)	.022 (.026)	.006 (.006)	.36 (.28)
No. 2. (West)	.08 (.10)	.010 (.016)	.003 (.005)	.52 (.72)

Several of these determinations came quite within the range of errors of analysis, others would indicate a slight variation in the composition of the samples. The last figures, however, corroborate the first in showing a water so low in oxygen required, albuminoid ammonia and chlorine as to indicate about the smallest amount of organic matter that is found in waters of even good quality. The free ammonia in both determinations is so high as to merit a rigid scrutinity. It must be admitted that it is quite unusual to find this amount of free ammonia that has arisen from the recent decomposition of proteid matter, without finding the albuminoid ammonia and oxygen required markedly higher. If the water is not from deep strata, and I understand it is not, I should say that the origin of this high ammonia should be carefully examined into, before the water can be declared quite free from contamination.

Yours truly,

CURTIS C. HOWARD.

We were unable to account for this high free ammonia, as there is nothing in the location indicating a pollution of the wells.

We therefore report without recommendation the facts found with respect to the proposed water supply of Logan.

COLUMBUS, OHIO, *June* 24, 1895.

MR. B. K. TRITSCH, *Secretary Water Works Trustees, Logan, Ohio:*

DEAR SIR: At a meeting of the State Board of Health, held in Toledo, June 19, 1895, your plans for a new water supply for Logan were approved. The outlet for your proposed sewerage system was approved, subject to the conditions that the city of Logan agrees to purify its sewage in a manner satisfactory to the State Board of Health at the end of five years from the date of the first use of the sewer outlet.

Yours truly

C. O. PROBST, *Secretary.*

REPORT ON CHANGE IN WATER SUPPLY OF LORAIN.

COLUMBUS, OHIO, *April* 3, 1895.

Mr. H. J. BARROWS, *President, Water Works Board, Lorain, Ohio:*

SIR: The State Board of Health has considered your application to approve the propsed change of the source of the public water supply of Lorain. Approval is withheld pending further investigation, as the Board is not satisfied that the proposed lake intake is sufficiently removed from the mouth of Black river to avoid sewage contamination.

Respectfully,

C. O. PROBST, *Secretary.*

ROCHESTER, N. Y., *June* 1, 1895.

H. J. BARROWS, ESQ. *President Water Works Trustees, Lorain, Ohio:*

DEAR SIR: The undersigned reports as follows in regard to the proposed improvement of your water supply and the various cognate heads relating thereto.

The general question submitted to me for an opinion may be stated in this form. What course should the city of Lorain take in order to insure a pure water supply from Lake Erie for all time to come?

In order to inform myself as to the special conditions of the problem, I spent May 9-13 inclusive at Lorain gathering such general data as could be gathered in that space of time.

Now in order to understand the discussion, it will be desirable to first define briefly the existing conditions at Lorain.

In the first place the Black river, which has, according to an estimate made by Mr. Fauver, the city engineer, a drainage area of 410 square miles, flows into the lake about a quarter of a mile from the present water works intake. This stream also flows through the city of Elyria only about ten miles away and receives a considerable amount of pollution from that place, which is stated, however, to be not yet provided with a complete sewer system although there are sewers in the principal streets, which undoubtedly contribute an appreciable amount of organic filth to the stream. Water works were constructed in Elyria in 1879 and the hotels and business blocks and many residences are stated to be fitted with water closets. The main outfall sewer of Lorain itself also debouches into the river about 1,800 feet from the mouth, at the extreme end of the jetty piers.

As a whole the present arrangement is such as to give a serious pollution of the Lorain water supply, and it is a matter of little surprise that typhoid fever, which invariably accompanies the drinking of sewage polluted water, has been seriously prevalent in Lorain in recent years.

The drainage area of the Black river is mostly from the heavy soils of the Ohio shale region where the natural characteristic of the streams is a wide range from the maximum to minimum flow. In the absence of gaugings the flow can only be determined by comparison with other streams of about the same drainage area and issuing from a region of the same geological characteristics.. Without going into detail it is sufficient to say that working in this way it is determined that the usual dry weather flow may be taken at about forty to fifty cubic feet per second, while the ordinary flood flows may be taken at from 10,000 to 15,000 cubic feet per second, with an occasional extreme of perhaps 20,000 cubic feet per second. We conclude then that the flood flows are from 250 to 300 times as great as the low water flow.

Deep water extends from the mouth of the river to perhaps five miles back, the cubic content of the deep water portion being estimated by Mr. Fauver at 70,000,000 cubic feet. The balance of the stream is affected with rapids, and the sewage of Elyria

receives the benefit of a few miles rapid flow over a rocky bed before passing into the still water of the navigable portion of the stream.

The deep water portion is now polluted with the sewage of the Johnson Company's Works and town, the sewage of Lorain proper, and the washings of two fish houses situated upon its banks, together with the sewage of Elyria and the more or less objectionable drainage of other towns on or near the headwaters of the stream. The sum total of this pollution is not large, but its accumulation, in the still water reach of the river in the time of low water, to be swept out at flood time, constitutes an element of great danger to a water supply taken at any point fairly within the influence of the stream when in flood flow.

The minimum flow of say forty cubic feet per second gives a total per day of 3,456,000 cubic feet. On this basis, assuming uniform current, there would be a change of water, in the deep water section in dry weather, only once in twenty days. It is certain then, if the pollution is allowed to go on, that the time will certainly come when this part of the stream will be offensive in summer. At present the pollution is too small for such a result, and this conclusion is to be taken as applying to the future, when further growth of Lorain and Elyria has produced, as it will, an increase in the quantity of pollution.

A flood flow of 10,000 cubic feet per second would mean 864,000,000 cubic feet per day, or, assuming as before uniform velocity, over twelve changes per day. In the same way a flood flow of 15,000 cubic feet per second will lead to about 19 entire changes of water in the lower river per day.

During the low water season the velocity of the flow in the lower river is so slight that the polluting organic matter settles to the bottom, where it remains nearly unchanged until a flood flow occurs of sufficient volume to sweep it out into the lake. In this way the accumulation of several months may be swept into the lake in a few hours, where under certain conditions of winds and currents it may be disseminated throughout the entire body of lake water for a radius of several miles from the mouth of the river. It therefore follows with the certainty of a proposition in mathematics that a water supply taken in the vicinity of the mouth of a stream like the Black river is liable at times to serious contamination. On this point extended observations have been made in England as to the relation between floods in the river Tees and the prevalence of typhoid fever in certain towns which derive their water supply from that river, from which it appears that in 1890 and 1891, the years in which the observations were made, nearly every flood was followed by a considerable rise in the typhoid fever rate in the towns observed.

In order to illustrate the possible effect of the flood flow of the Black river in the way of contaminating the Lorain water supply it is pointed out that a flood flow of 15,000 cubic feet per second, which may occur at least once a year, will amount to 1,116,000,000 cubic feet in twenty-four hours, a quantity of water sufficient to make ten feet in depth over an area of four square miles.

We may now take up the recent endemic of typhoid fever at Lorain for brief discussion.

Dr. S. S. Cox, Health Officer, has furnished a statement of the total number of fatal cases of typhoid fever in Lorain from 1889 to the present time from which table No. 1 has been compiled. According to the statement of Dr. Cox, sewers were constructed in Lorain in 1892, their use for water closet drainage beginning in October or November of that year. The table shows that previous to their construction the deaths from typhoid fever were only such a number as may be expected in a population of about 5,000, where no special contamination of water supply exists. The few deaths which actually occurred were in the fall of the year, the normal season of typhoid fever. This fact leads to the conclusion that for the comparatively small amount of sewage then contributed to the Black river by the city of Elyria, the self-purifying agencies of the river and lake were sufficient, and even with the extremely unfavorable location of the present intake no serious contamination of the water supply took place; but the contribution of even a slight amount of raw sewage near the water works intake was sufficient to destroy

at times the small margin of safety which had previously existed. The result is saliently presented by the statistics of table No. 1, from which there appears in 1893 and 1895 to have been a serious rise in the typhoid fever mortality in the winter and spring months—when this disease is not usually prevalent, except in the case of drinking sewage polluted waters containing its germs.

TABLE No. 1. Showing the number of fatal cases of typhoid fever at Lorain, Ohio by months and years, from 1889 to 1895.

Months.	1889.	1890.	1891.	1892.	1893.	1894.	1895.
January					1		
February							3
March					2	1	2
April					6		4
May					1		*1
June							
July							
August		1				2	
September	1		1	1			
October			2		1	1	
November				2			
December	1						
Totals	2	1	3	3	11	4	10

*Date of making table, May 10, 1895.

Dr. Cox has advanced the view that the endemic condition of March–May, 1895, and February–May, 1895, was due largely to the closing of Lake Erie with ice for a long distance out during the winter months of those years, and cites the exemption from typhoid in 1894, when the lake was not so closed, as confirming this view. This is undoubtedly a rational explanation of the matter. The typhoid germ is much shorter lived in sunlight than in the dark, while the antagonistic nitrifying organisms which can only act effectively in the presence of a plentiful supply of oxygen are necessarily more or less dormant when the lake is covered with ice. Observations bearing somewhat on this point have been made at Philadelphia, Pennsylvania, and at Zurich, Switzerland, and to which we may properly refer in this place.

In January, 1893, the Schuylkill water supply of the city of Philadelphia, while covered with ice, was affected with a bad taste and odor, the same as has characterized the Lorain water supply during the winters of 1893 and 1895. An investigation was made by Dr. Albert R. Leeds, who concluded "that the taste and smell were connected with a state of partial and arrested oxidation and of incomplete æration."

From the water works reports of Zurich, Switzerland, for 1891, it is learned that in 1880, when the lake of Zurich, from which the water supply of the city is derived, was

frozen over, an endemic of diarrhœa and typhoid fever occurred, which was attributed to the water supply. In 1891 the lake was again closed with ice for several months, during which frequent examinations of the lake water showed the presence of an abnormally large number of micro-organisms. Between 1880 and 1891 (in 1886) filtration works were established at Zurich, and although in 1891 the same conditions existed in the lake as in 1880, still, due to the protective effect of the filters, the public health was totally unaffected. This experience at Zurich, which is similar to that of other foreign cities, suggests the proper remedy to apply at Lorain and other Lake Erie towns, and which we will discuss a little in detail further on.

Lake Erie is usually clear of ice April 1, and the question may be asked, why, after the natural purifying agencies have again come into operation, the endemic of typhoid does not immediately cease. The answer is that typhoid having once become established in the town, there are probably considerable quantities of typhoid dejections passing daily into the sewers which serve to maintain the supply in the river and affected portion of the lake. Hence some little time is necessarily required before the antagonistic agencies of sunlight and nitrifying organisms can regain the ascendency. This view leads at once to the conclusion that, whoever allows the natural dejections of typhoid patients to pass into sewers affecting a public water supply assums in effect the responsibility of imperiling human life. On the other hand the authorities in charge of a public water supply liable to be so contaminated who do not inaugurate measures of certain prevention have equally assumed the same responsibility.

As a primary deduction from the foregoing, we may say, then, that the dejections of typhoid patients should not be disposed of through the sewers, or, if they are allowed to pass therein, they should first be thoroughly disinfected. Inasmuch as I have discussed this phase of practical sanitary work very extensively in "Sewage Disposal in the United States," page 13, I will not consume time to repeat what is there said in this place, but merely refer you to that work for detailed information on this point.

The present population of Lorain is a little over 10,000, and with an allowance of about 100 gallons per day, which is large enough to include the manufacturing use, the present use of water ought not to exceed a daily total of 1,000,000 gallons. However, not more than 6,000 people are now using water, and when we take into account the character of the major portion of the residences, it is my fixed opinion that at the present time from 400,000 to 500,000 gallons per day is ample to supply all the water required for manufacturing and all other purposes in Lorain. It is further my fixed opinion that a vigorous administration of your water works would easily lead to a reduction of the daily use to about these figures. As proof on this point I may mention that during my recent visit to Lorain a single horse trough was noted as discharging at least 100,000 gallons per day, whereas from 5,000 to 7,000 gallons per day would have been ample. Again at one of the livery stables water was being wasted in a way that would not be tolerated in any place where the relation between cause and effect in water works management was fully understood. Under this head my advice is therefore to meter *all* large services *at once*, fit horse troughs with automatic self-closing fixtures, establish definite hours to which street and lawn sprinkling are to be confined, and finally by systematic inspection of house services reduce the tendency to allow such to run continuously. Money expended in providing one or two good inspectors to look after unnecessary waste will be well invested. By such measures you will finally bring your town in line with the constantly increasing number of places where the water furnished is used and not wasted. It seems unnecessary to give the statistics of a number of American cities where this condition prevails, as they are now numerous enough to have passed beyond the stage of novelty.

The full amount of reducing the amount of water to be furnished to the lowest possible quantity and its relation to total cost of water works for your town will appear as we proceed.

TABLE No. 2. Chemical analysis of samples of water from Black River and Lake Erie. Samples taken May 17, 1895, by F. C. Norcross.

Sample from	Results in parts per million.						
	Total solids.	Chlorine.	Oxygen consuming power.	Nitrogen, by permanganate of potash.	Nitrogen in ammonium compounds.	Nitrogen as nitrites.	Nitrogen as nitrates.
10 miles out—surface	130	6.0	.01	.051	.015	None.	Trace.
10 miles out—40 feet down	142	6.0	.03	.072	.017	"	.08
10 miles out—bottom 65 feet	123	6.5	.10	.090	.020	"	Trace.
Fish pond	133	6.3	.08	.064	.022	"	.10
Water works crib	143	7.0	.10	.074	.016	Trace.	.20
Mouth of river	254	9.5	.64	.156	.097	.006	.54

Hugo Carlsson.

TABLE No. 3. Results of a microscopic examination of water from Black river and Lake Erie in numbers per cubic centimetre. (Same sample as in Table 2.)

Description of sample.	Infusoria.	Rotifera.	Crustacea.	Diatomaceæ.	Zoospores.	Chlorophyceæ.	Cyanophyceæ.	Amorphous matter.	Vegetable fibers.
Surface 10 miles	88	.....	0.1	260	65	.....	.....	11	0.1
10 miles out—40 ft. bel. surf'e	61	.....	0.1	360	42	0.1	2	9	2
10 miles out—bottom	29	.....	0.1	583	68	.....	.....	3	.....
2½ miles out	23	.....	.....	310	157	.....	.....	10	2
Water works crib	33	.....	.....	390	150	.....	.....	13	0
Mouth of river	20	1	.....	330	168	.....	.....	56	4

Samples taken May 17, 1895.
Examined May 19, 1895, by Geo. W. Rafter.

Tables Nos. 2 and 3 give the results of chemical and microscopical examinations of samples of water taken May 17, 1895. The tables show essentially the same composition of all the samples except that from the mouth of the river where the presence of the sewage is indicated by the rise, in the chemical results, of the solids, chlorine, oxygen consuming power, etc., and by the increase in the amorphous matter in the microscopical results. The samples from ten miles out were taken in order to show the composition of the normal water of Lake Erie at this season of the year. For several days previous to taking them there had been a severe gale from the west and north-west, the effect of which was to extend the line of normal water in to very close to the shore.

In a report of an examination of a series of samples of Lake Erie water made for the Johnson Company in April last, it is shown that the quality of the water on the lake front at Lorain will vary from time to time with changes of wind and lake currents. These changes will extend over considerable distances and necessarily complicate the question at every turn. The difficulty is to know when we are certainly beyond the influence of the contaminating sewage. In view of the uncertainty which must always exist on this point, the only safe course is to adopt those measures which insure safety under any and all conditions. It follows from the foregoing that studies of pollution problems in the great lakes are necessarily largely physical in their nature and of wide range.

The general recommendation under this head is then to go out, as soon as you can perfect the necessary plans, some distance into the lake. For this purpose the line of the present intake may be extended with results as satisfactory as can be expected anywhere. The water obtained from well out in the lake should as a further precaution ultimately be filtered the same as at Zurich and other foreign cities.

As to the distance out, the further the better, although this will be in some degree determined by the character of the crib at the end of the intake pipe. For this purpose I suggest a submerged crib from nine to ten feet in height and placed in about thirty-five feet depth of water. This necessarily carries the crib out about two miles on the line proposed. At this distance out the waves exert considerable force even at the proposed depth and the crib structure should be of the most substantial character.

The question arises, why go out to a depth of thirty-five feet? The answer is that lake vessels are now regularly built drawing from eighteen to twenty-feet, and off Lorain waves at least ten to twelve feet in height may be expected in any severe gale. This means that the trough of waves may be five to six feet below the normal lake surface. Adding together the extreme draft of large vessels, taken at say nineteen feet, the height of the crib itself above lake bottom, of say nine feet, and the depth of the trough of waves say 5.5 feet, and we have (19+9+5.5) 33.5 feet, which leaves a possible leeway between bottom of vessels and top of crib in thirty-five feet of water of only 1.5 feet, which is certainly as little as should be allowed for contingencies.

As to the size of the intake pipe. With the maximum use of water kept within 1,000,000 gallons per day per 10,000 population, a 24-inch intake pipe will be sufficient for a population of 40,000, or, what is the same thing, will permit of drawing 4,000,000 gallons per day from a distance of two miles. The suction well at the shore end of such an intake should be about fifteen to eighteen feet in diameter and fifteen feet deep below the low water lake surface. The pumps should be so placed as to limit the suction lift to not more than eighteen feet.

This part of the question further raises the question of future growth of Lorain. I will not discuss this part of the problem at this time, but merely cite you to pages 129 and 130 of "Sewage Disposal in the United States," where my views on increase in population in American towns may be found. At present it appears clear to me that an increase to 40,000 in twenty years is a very liberal estimate. It is not deemed advisable to make provision in these matters more than twenty years ahead, because the interest on the invested money makes the works more expensive than to enlarge at the end of each twenty-year period.

The extension of your present 24-inch intake to the distance of two miles from the shore is estimated to cost, at the present price of materials and labor, including a proper submerged crib, $58,000.

Your superintendent, Mr. Norcross, is of the opinion that the extension from end of 24-inch intake, as now contracted for, should be made with 36-inch pipe, but for the reasons indicated in the foregoing this seems to be an unnecessary expense at this time. The cost of such an extension would be about $80,000—or $22,000 more than the 24-inch. The 36-inch intake would, however, permit of drawing from 14,000,000 to 15,000,000 gallons per day from two miles out.

In making the foregoing suggestions I again repeat the opinion that 100 gallons per capita per day is, with wastes eliminated, an ample supply even for a large manufacturing town such as you expect Lorain to grow into.

Considerable time has been spent in studying the availability of the sands from the lake beach for the construction of filter beds, but the time at my disposal for this part of the study has been too limited to enable me to arrive at a definite conclusion. Before this question can be fully settled quite an extended study should be made, and as the problem is a general one applying to all the Lake Erie towns, probably the State Board of Health could undertake it with profit to all the cities interested. Work of this character by the State Board would be in line with similar work already accomplished by the State Board of Health of Massachusetts where investigations relating to water supplies in that State have been in progress for several years.

The filtering of Lake Erie water is considerably complicated by the presence after several gales of an exceedingly fine clay silt stirred up from the bottom, which for nearly the whole lake is recorded on the lake chart as "blue clay." The lake is so shallow that every gale disturbs this silt and consequently creates an ever present difficulty which may necessitate some special treatment in order to fully overcome it. This water could be successfully treated so far as taking out the silt is concerned by mechanical filters, but unfortunately these filters leave the dissolved impurities of sewage pollution mostly untouched. Inasmuch as the object of filtration is in this case to remove the danger inherent in a sewage polluted water, it follows therefore that mechanical filters do not furnish a complete remedy. Driven well systems have also been looked into with special reference to their availability here but without any encouraging results.

With the maximum use of water kept down to somewhat less than 1,000,000 gallons per day, an uncovered sand filter sufficient for sand purposes can be built for $16,000; or, if it were deemed desirable to provide for a daily use of 2,000,000 gallons per day at once, the cost of filter areas would be $33,000. These figures include in both cases the cost of the necessary rearrangement of the pumping station.

Mechanical filters with the necessary rearrangement of the pumping station would cost about $10,000 per million gallons filtered. The cost of operating mechanical filters may be taken at about $3.50 per million gallons filtered, while ordinary sand filters may be operated at about $2.50 per million gallons.

Sand filters have been used at the cities of Hudson and Poughkeepsie, N. Y., for over twenty years and are still doing good service. The polluted water of the Hudson river is rendered safe to drink by their use. A similar filter plant was installed at Lawrence, Massachusetts, in 1893, and a material improvement of the Merrimac river was effected by its use. A number of other cities either have such filters in use or are contemplating constructing plants in the immediate future.

As to the disposal of sewage at Lorain. The original sewerage as constructed in 1892, is on the combined system, while the sewers of the Johnson Company's addition, now under construction, are on the separate system. The topographical conditions at Lorain admit of applying the separate system to the whole town, and in view of all circumstances it seems unfortunate that it was not so applied, for the reason that the problem of efficient purification is complicated and the expense thereof increased by the

addition of storm water. Moreover, it may be pointed out that the combined sewers as actually constructed are now taxed to their full capacity in severe storms; hence any considerable extension of the combined system will be likely to lead to a reconstruction of the main sewers at probably large expense. Again, the recent extensive additions to territory will lead to further contributions of sewage over and above that originally provided for. The paving of streets and the increase in roof area of new buildings both tend to the same result. The vast area now included in the city limits further complicates the problem. In the absence of accurate data I am unable therefore to offer other than general suggestions on this part of the subject. In the first place, a complete topographical map of the entire area now included in the city limits should be prepared, under the direction of an engineer of experience in this special class of work, as otherwise data of importance to the solution of the problem in hand is very likely to be omitted. With such a map at hand it will be possible to decide just what is the best thing to do with reference to adequate provision for the future as well as a proper final utilization of the existing sewers.

Waring, Chapman and Farquhar, in a report made to the Johnson Company in October last, have outlined a scheme of sewage disposal for the Johnson Company's property only. Since that time the area referred to in their report has been annexed to the city of Lorain and the disposal of its sewage must be considered in connection with that of the balance of the city. Without intending to express a final opinion at this time, I may say that probably all the sewage of the city should be brought to the present outfall at the foot of Broadway, conveyed across the Black river by a siphon to the east side and there treated either by intermittent filtration or by such inexpensive chemical treatment as will remove the larger portion of the solids. There is on the lake front at the east side of the Black river an unoccupied area of several acres, which could be made available for sewage disposal works at moderate expense, and where, with properly designed works, the process of purification could be conducted without offense to anybody.

In this connection it may be remarked that the unfavorable nature of the clay soils about Lorain renders purification by broad irrigation out of the question except at an expense that would be prohibitive. At present the local data is not at hand which would enable one to give close estimates of cost on either that or the other methods of disposal. Whatever method of purification may be finally used, the purified effluent would be discharged into Lake Erie through iron pipes laid some distance out into the lake and to the east of the present jetty piers of the harbor, where it is assumed the distance from the water works intake would be great enough to insure, through the action of the natural agencies, the necessary further purification of the effluent before, even under the adverse condition of a severe eastern storm, it could reach and mingle with the drinking water.

Probably it will appear to business men, without technical knowledge of the whole subject, like taking unnecessary precautions to (1) go a long distance into the lake; (2) to filter the water taken from such long distances in order to make it perfectly safe to drink; and (3) to purify the sewage of the town as a final precaution. You will please bear in mind, however, that you have requested my views in reference to the future as well as to the immediate present, and the fact that the recent advances in knowledge of water sanitation point to all possible precautions is the reason for suggesting that your future action be in the lines here laid down. Lake Erie is not on the whole a desirable source of drinking water and the course I have outlined is necessary in order to place your water supply on the same high plane of safety as that attained in many of the foreign towns. In England every town is obliged by law to purify its sewage before discharging it into streams, and filtered water supplies are taken from streams receiving purified sewage effluents without noticeable ill effects.

By way of summary I will repeat briefly the various suggestions and recommendations.

(1) To extend your new 24-inch main as soon as necessary plans can be perfected on the line on which it has been started to a distance of at least two miles into the lake.

(2) To make such further study of the possibility of filtration as may be necessary to determine just what results can be obtained with the Lake Erie sands, reference being had always to ultimately filtering your entire supply.

(3) The town should have the necessary topographical surveys made of the whole area in order to place the sewerage and sewage disposal question on a rational basis, with reference to beginning purification of the sewage at some time in the future, if the town grows.

(4) To decrease waste of water by proper restrictive measures, thereby lessening greatly not only the first cost of works but the annual cost of operation as well.

I also make another suggestion in line with that of decreasing waste, namely, you will secure better work by preparing detailed plans and specifications in advance of actually beginning construction. By so doing you will avoid many vexations and expensive errors.

In conclusion I may say that both the time and data at my disposal for this study have been inadequate to anything like a final solution of all the problems presented. However skillful as an engineer one may be, it is impossible merely as the result of spending a few days in your town to give you a complete scheme for the several classes of works, your case demands. Quite contrary to the popular impression, engineering problems are not solved in this offhand way. Data must be gathered and arranged before sound conclusions can be reached, and especially must the pestiferous notion be avoided that what has proven best for one place is necessarily the best for some other place, differently situated and where different conditions obtain.

This report has grown to such length that I have left undiscussed a number of interesting but relatively unimportant questions on which you informally asked my views while at Lorain.

Very respectfully,

GEO. W. RAFTER,
Consulting Engineer.

REPORT ON THE PROPOSED WATER SUPPLY FOR MONTPELIER.

BY R. D. KAHLE, M.D.

To the Ohio State Board of Health:

GENTLEMEN: Montpelier, Williams county, a village of about 2,000 inhabitants, is putting in a plant to supply that village with water, and desires the approval of the State Board of Health of their source of supply; and as your committee I inspected their proposed source of supply September 17.

They propose to get the water for their village from deep wells situated about one-half mile south from the business portion of the village. The land slopes to the west so that the natural drainage is away from the wells. The nearest residence is about two hundred feet from the wells.

The first test well drilled is six inches in diameter and 115 feet deep. It is drilled through thirty-seven feet of blue clay, twenty-five feet of gravel, six feet of hardpan and forty-five feet into a bed of gravel, and is

cased with iron casing. The second well is thirty feet from No. 1, and 100 feet deep. The third is thirteen feet from No. 2, and is eighty-five feet deep. Numbers two and three are eight inches in diameter. The surrounding country is not thickly settled. The wells are about one-half mile from a small river but evidently have no connection with it. From the depth and location of the wells, as well as the strata through which they are drilled, I see no danger of pollution and believe they will yield a good potable water, and recommend the approval of their source of supply.

COLUMBUS, OHIO, *September* 24, 1895.

To the Mayor and Council, Montpelier, Ohio:

SIRS: The State Board of Health has considered your application for approval and caused an examination to be made of the water supply proposed for your village, to-wit, from deep wells situated about one-half mile south of the business portion of the village, and the same is hereby approved.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON THE PROPOSED WATER SUPPLY FOR OSBORN.

BY BYRON STANTON, M. D.

To the Ohio State Board of Health:

GENTLEMEN: The village of Osborn, Green County, having made application to the State Board of Health for approval of a proposed water supply for that place, on September 14, 1895, I made an inspection and would report as follows:

Osborn is a place of about one thousand inhabitants, in the Miami valley, nine miles northeast of Dayton. The proposed water supply is to be pumped from wells, at first four in number, six inches in diameter, and to be not less than fifty feet apart. Each well is to be provided with a heavy well-casing throughout its depth except at the bottom, where a suitable screen shall be provided covering a depth of not less than ten feet.

The test well that has been sunk shows a stratum of clay soil about four feet deep, below which is a stratum of gravel and coarse sand about twenty-five or thirty feet deep, then a stratum of hardpan, below which is a coarse gravel from which the water is to be obtained.

The wells are to be not less than forty-six feet deep. They are about one thousand feet from the Miami river and will be sunk to about thirty feet below the bed of that stream. They are situated on the northeast of the village near the foot of a hill over fifty feet high, the top of which

represents the general level of the country for miles to the east. The underground current is supposed to be from the east to west, and as Springfield, the nearest town of any size, is fourteen miles away, there is but little danger of any contamination from that direction.

From the depth and location of the wells and the character of the strata through which they are sunk I have no hesitation in recommending the approval of this source of supply.

COLUMBUS, OHIO, *September* 21, 1895.

To the Mayor and Council, Osborn, Ohio:

SIRS: The State Board of Health has considered your application to approve the proposed water supply for your village, from wells situated to the northeast of the village, and about one thousand feet from the Miami river, and the same is hereby approved.

Respectfully,

C. O. PROBST, *Secretary.*

AN INVESTIGATION OF THE WATER SUPPLY OF PAINESVILLE.

BY C. O. PROBST, M. D., SECRETARY.

MR. PRESIDENT: The board of health of Painesville adopted a resolution requesting me to investigate the public water supply of that village. I went to Painesville on March 18, and found conditions as follows:

A foreign company, thirteen years ago, contracted to furnish the village with water for fire and domestic purposes. The company agreed to furnish an abundant supply of pure and wholesome water. First it was attempted to obtain a supply by ten or twelve infiltration wells, about nine feet in diameter and fifteen to eighteen feet deep. The quantity was insufficient.

A small creek, not far from the wells, was then dammed, and water pumped to a small reservoir, forming an auxiliary supply. Freshets tore out the dam and the entire plant was abandoned.

For a short time water was pumped from Grand river, a polluted and unsatisfactory supply. The company then went to the shores of Lake Erie and put down a number of infiltration wells on the beach, about one hundred yards from the water's edge. These did not furnish enough water, and have practically been abandoned. They then put in filtrating galleries along the edge of the shore, and partly under water. They trenched five and one half feet deep. In the trench are wooden boxes about twelve to eighteen inches inside measurement. The boxes are open at the bottom, closed at the top by plank, and at the sides by coarse wire

netting. Two feet of fine soft coal screenings were placed on either side of the boxes, and one foot of the same over them. Lake sand was placed over all to surface level. The galleries deliver water by gravity to what might be called a reservoir. This is built of plank, sunk in the sand on the shore between the galleries and the pumping station. It is 200 feet or more long and about 8 feet wide. There are about 800 feet of filtering galleries. This is supposed to give the present supply; but a pipe has been laid to the lake from which they can pump as occasion demands.

I learned that the council of Painesville had lately refused to pay water rents to the Water Works Company, on the ground that the contract to furnish pure, wholesome water was not being fulfilled.

The board of health recently made an investigation of the supply and condemned it. They adopted and published the following resolution:

Resolved, That it is the sense of the board of health that the water now furnished by the Painesville Water Works Company is unfit for domestic use until it has first been boiled or filtered; and that we instruct the health officer to so publicly warn the citizens of Painesville.

On the 19th, I went with the board of health, health officer and two members of council to inspect the supply. At the pumping station we met Mr. Stephens of New York, superintendent of the company, Mr. Tabor, assistant superintendent, and the engineer, Mr. Hailstone.

Two sets of conditions endanger the water supply of Painesville. First, those purely local and easily removable will be mentioned. On the surface of the sand, within eight to twenty feet of the filtering galleries and wooden reservoir, were found six or eight piles of human feces. These were found uncovered by the board of health at its investigation made several days before. At the time of my inspection they had simply been covered with a shovel full of sand. The fact that they were not removed when attention was first called to the matter, shows a lack of proper appreciation of the danger of having such material so near the filtering galleries, or an unwarranted trust in the filtering capacity of a foot or two of sand and coal.

A part of the wooden reservoir, on the side towards the pumping station, is flush with the surface of the ground. Back of the pumping station is a hillside, two houses being located on the top of the hill. There is a continuous slope of the land from these houses to the reservoir; and surface water, running down this hill, will in all probability gain access to the reservoir, which is covered with loose fitting boards. Near the top of this hillside at one house is a barn and a privy. The latter is without a vault or other receptacle, feces being deposited on the ground. House slops are thrown on the side hill. Rains would wash this filth down near to the reservoir, but probably not into it, owing to breaks in the land.

At the other house is a privy with a loose wooden box. Considerable fecal matter was deposited outside of this box. All house slops are thrown onto the hillside. Rains washing over this surface would with great probability carry filth into the reservoir.

The privy at the pumping station has a vault lined with boards. It is within 100 feet of the wooden reservoir.

These conditions which endanger the water supply could be easily remedied.

Other conditions exist which make it probable that the supply is liable to contamination at the fountain head, i. e. the lake.

The sewage of Painesville discharges into Grand river. Drainage from Fairport Harbor and Richmond, two incorporated villages near the mouth of this river, also enters it. (I neglected to say that the water company supplies these villages, as well as Painesville, with water—all from the same source.)

In addition to these sources of pollution, there are several large fish houses on the river, and during the fishing season large amounts of fish cleanings are thrown into the river.

The river discharges into Lake Erie between piers extending several hundred feet into the lake. The distance from its mouth to the pumping station is about one-half mile. The lake currents ordinarily are to the east, away from the pumping station, but at times matters floating down the river are carried westward, beyond the pumping station.

The conditions are very similar to those existing at Lorain and Ashtabula, with which this Board is familiar.

I have already stated that at times water is pumped directly from the lake, the intake being extended but a short distance from the shore. Apparently the greater part of the water being pumped at the time of my inspection was coming from the lake; and this could not be shut off by the valve controlling this supply. The engineer stated that something must have gotten under the valve.

But even if all water is taken from the filtering galleries, the supply will be principally lake water imperfectly filtered through sand and coal. It is doubtful whether any great improvement is made in the purity of the water by this method of filtration.

The water company has undoubtedly spent considerable sums in endeavoring to find a suitable water supply. Apparently ground water can not be obtained in sufficient quantity. The adjacent streams are not of sufficient purity, and the lake supply, as at present obtained, is liable to pollution.

Three plans suggest themselves for obtaining a better water supply:

1. By constructing and maintaining proper filtration works at or near

the present location of the pumping station. 2. By extending the lake intake far enough to avoid contamination by Grand river, or 3. By moving the lake intake westward a sufficient distance to escape such contamination.

COLUMBUS, OHIO, *April* 3, 1895.

To the Board of Health, Painesville, Ohio:

DEAR SIRS: I enclose herewith a copy of a report on the water supply of Painesville, which was presented to the State Board of Health on March 27, 1895.

The report was adopted, and also a resolution disapproving of the present water supply.

Yours truly,

C. O. PROBST, *Secretary.*

REPORT ON PROPOSED WATER SUPPLY FOR PORT CLINTON.

BY R. D. KAHLE, M. D.

Mr. President: I accordance with your appointment, I visited Port Clinton on March 20, and examined the plans and proposed source of water supply, and beg to report as follows:

The water supply is to be taken from Lake Erie, the crib is to be located 2,400 feet from the shore, and 1,000 feet from the mouth of the Portage river; the flow of the river is down the lake, away from the proposed location of the crib, so there is no danger of contamination from the river. The crib is to be forty feet square, the inner crib is to be twelve feet square and the water is to be filtered through twelve feet of washed lake gravel into the inner crib or intake. The intake pipe that connects the crib with the pumps is to be sixteen inches. The principal main is to be fourteen inches and no main is to be of less diameter than six inches. Their plans call for about eight miles of mains. The direct pressure system is to be used, two pumps with a combined capacity of two million gallons per day will be used; a supply that will be equal to the needs of a city of 30,000 population. There is to be a river connection which is to be used only to force sand, or anything that may accumulate in the intake pipe, back into the lake. The intake pipe is so arranged with valves that a back pressure will flow directly into the lake and not into the crib.

The estimated cost of this plant is $42,000. Work is to be commenced by April 1 and completed by August 1, 1895.

I am much indebted to Mr. O. J. True, President of the Water Works Trustees, for courtesies extended in showing and explaining their plans and source of supply.

I believe the water supply proposed for Port Clinton is an excellent one, and recommend its approval.

COLUMBUS, OHIO, *April* 3, 1895.

MR. S. H. MIZEUR, *Mayor, Port Clinton, Ohio*:

SIR: The State Board of Health has considered your application to approve the proposed water supply of your village, to be obtained from Lake Erie 2,400 feet from the shore and 1,000 feet from the mouth of Portage river.

The Board's attention has been called to water supplies taken from Lake Erie under somewhat similar conditions in the villages of Ashtabula, Lorain and Painesville, where there is reason to suspect that west currents in the lake at times endanger the water supply.

Approval of your proposed supply is therefore withheld pending further information, to be furnished by you, showing the direction of lake currents at Port Clinton, and the probability of contamination of the supply by sewage and drainage discharged into Portage river.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON A PROPOSED ADDITIONAL WATER SUPPLY FOR SALEM.

BY JOSIAH HARTZELL, PH. D., AND C. O. PROBST, M. D.

To the State Board of Health:

The Water Works Company of Salem made application, through its superintendent, Mr. F. W. Allison, to approve a proposed additional water supply. The undersigned committee was appointed by the president to make an investigation, and visited Salem May 28.

The present supply is obtained from three drilled wells, in the city limits, known as the Silver Spring Supply, and from Roger's spring, some distance away. The water is collected in a small reservoir or basin, and pumped to consumers.

The supply is inadequate to the demand, and at times, for short periods, the city has been without water.

It is proposed to obtain additional supplies from a shaft sunk a few years ago for coal, but which was not used for any purpose. This shaft is about ten by twelve feet, and is forty-nine feet deep. The superintendent of the water works has furnished the following data of the geological formation in this location:

FORMATION AT WELL ON SHAFT LOT.

4	feet of	clay.
20	"	sand and gravel.
14½	"	rock.

15 feet of shale rock.
18½ " slate.
1 foot of coal.
5 feet of fire clay.
21½ " shale.
Total depth, 99½ feet.

The shaft is located in a swamp near the foot of Broadway, and within city limits. The adjacent hills, city-ward, are thickly populated, and the surface wash is towards the shaft.

There is another coal shaft, No. 2, we will call it, in the same valley, several hundred yards away from the shaft in question, which we designate as No. 1. We were informed that the water in shaft No. 2 was considerably lowered when shaft No. 1 was pumped.

A more unfavorable location for obtaining a ground water supply could hardly be found. Water was pumped continuously from the shaft for forty-eight hours, and a sample of the water was then collected for examination. It was examined by Mr. Oscar Textor of Cleveland, who reported as follows:

THE ANALYSIS OF THE WATER FROM THE ABANDONED COAL SHAFT.

The sample of water taken for analysis was drawn from the well after a pump throwing a six-inch stream had been working continuously for twenty-four hours.

The sample showed some turbidity, due to the clay and sand coming off the board lining to the shaft and getting into the water. On standing twenty-four hours the water became almost clear.

The water is free from any odor or taste.

The results of the analysis will be expressed in one table in parts per million, to admit of comparison with published analyses of Lake Erie water; in another table the mineral constituents in grains per gallon will be given:

THE MINERAL CONSTITUENTS IN GRAINS PER GALLON.

Silica	1.19	grains per	gallon.
Sulphate of lime	10.40	"	"
Carbonate of lime	10.10	"	"
Carbonate of iron	.15	"	"
Carbonate of magnesia	5.00	"	"
Chloride of sodium, or common salt	2.19	"	"
Volatile ammonia salts and organic matter	6 58	"	"
Total	35.61	"	"

TABLE 1. RESULTS EXPRESSED IN PARTS PER MILLION.

Total solids.	Loss on ignition.	Chlorine.	Free ammonia.	Albuminoid ammonia.	Hardness.
492.8	94.	20.	.175	.205	16.°

ANALYSIS OF LAKE ERIE WATER.

Total solids.	Loss on ignition.	Chlorine.	Free ammonia.	Albuminoid ammonia.	Hardness.
101.	31.2	1.92	.054	.246	44.5°
232.	46 8	2.22	.088	.358	.....

In comparing the analysis of the well water with that of Lake Erie, it will be observed that all of the items but the albuminoid ammonia show higher numbers. This is due to the fact that well waters have previously passed through many feet of soil and dissolved mineral matter which is held in solution by carbonic acid. This explains the large amount of total solids present and a consequent greater hardness of the water. The albuminoid ammonia figures indicate the amount of putrescible matter present, the most dangerous contamination in a water.

There is no indication of animal refuse matter in the sample, the slight amount of organic matter present is of vegetable origin, which is dissolved by the water filtering through the ground.

The mineral matter found in the water is the same as is present in all well waters, and is of a harmless character.

The four feet of clay immediately under the surface of the ground, as shown by the record of the formations passed through in digging the shaft, serve as an effectual barrier to the introduction of surface water from the immediate vicinity of the well.

I would add to the following, that in my opinion the water from this shaft is and will be most healthful and pleasing to the taste, and that it is in all other respects, and especially in its freedom from animal organic matter and in the small amount of vegetable matter it contains, compared with Lake Erie water, a desirable and excellent drinking water.

OSCAR TEXTOR.

STATE OF OHIO,)
CUYAHOGA COUNTY.) ss.:

Oscar Textor, being duly sworn, says that the above analysis has been made in accordance with the latest scientific principles and that he can and does personally vouch for the correctness of the same, both as to the process used and the conclusions reached, and that each and every statement in the foregoing report contained is true, to the best of his knowledge and belief.

(Signed) OSCAR TEXTOR.

Sworn to and subscribed by the said Oscar Textor, before me, this 17th day of May, 1895.

C. A. JUDSON,
Notary Public.

At the time of our inspection the shaft was full of water. A sample was collected at depth of about six feet. Another sample was collected at the "Silver Spring" pumping station, and a third at the pumping station at the reservoir or basin. These were examined by Prof. C. C. Howard, of Columbus, who reported as follows:

May 30, 1895.

Dr. C. O. PROBST, *Secretary State Board of Health:*

DEAR SIR: I have examined the three samples of water received from Salem, O., with the following results:

No. 1, Shaft. No. 2, Pumping station. No. 3, Silver Spring.

Parts per 100,000.

	Oxygen required.	Free ammonia.	Albuminoid ammonia.	Organic ammonia.	Nitrous acid.	Nitric acid.	Chlorine.	Total solids.
(1).	1.30	.059	.050	.098	.016	none	1.20	55.0
(2).	.13	.0005	.006.	.008	.001	.145	.28	34.4
(3).	.08	.003	.002	.004	.001	.142	.32	30.2

In expressing an opinion as to the quality of these waters it must be stated that there is no information as to their source or surroundings at hand, and this opinion is based entirely on the above figures. These are, however, of such a character as to permit the expression of a judgment with more freedom than is frequently possible.

No. 1 is one of the worst all-around waters it has ever been my fortune to meet. The first five figures indicate the introduction of a considerable amount of nitrogenous matter, probably animal, into the water; the entire absence of nitrates shows that this is of quite recent origin and that there has been no opportunity for nitrification. The large amount of nitrites suggests a particularly objectionable water, while the small amount of chlorides would seem to indicate the absence of animal excreta. It requires no assistance from a sanitary survey to pronounce this water absolutely unfit for use.

There is a general agreement in character in two and three, except that in the former the free ammonia is unusually low and in the latter the albuminoid ammonia is very low. The results show both these samples to be of very satisfactory quality. Whatever danger of contamination may exist, it is quite certain that at present these waters are of quite high degree of organic purity.

The statement of the temporary hardness of these waters was accidentally ommitted in the table. It is as follows: No. 1, 16.4; No. 2, 22.4; No. 3, 19.4. The permanent hardness was not quantitatively determined. It is moderately high in No. 1, but quite so low in No. 2 and No. 3.

Very truly,

CURTIS C. HOWARD.

In consideration of the bad location of this shaft from which it is proposed to obtain water, and of the results of chemical examination of a sample of the water, your committee recommends that the application for approval should not be granted.

COLUMBUS, OHIO, *June* 22, 1895.

Mr. F. W. ALLISON, *Supt. Salem Water Company, Salem, Ohio:*

DEAR SIR: Your letter of the 20th instant just received. A report was made to our Board, at its Toledo meeting, in regard to obtaining the water supply from the shaft. The Board voted to disapprove of the water supply from this source. The opinion was expressed that the location of the shaft was such as to render it practically impossible to guard against all danger of pollution. I do not think, therefore, that it will be necessary to make another analysis of the water from the shaft, as the Board would not approve of this for a supply.

Yours truly,

C. O. PROBST, *Secretary.*

REPORT ON THE PROPOSED WATER SUPPLY FOR ST. BERNARD.

BY BYRON STANTON, M. D.

To the State Board of Health:

GENTLEMEN: On June 25, 1894, I was appointed by president Nelson to visit St. Bernard, Hamilton county, and enquire into the proposed water supply for that place. Owing to legal difficulties the work upon the wells was suspended about the time of my appointment and I was requested by the health officer of the place to defer my inspection until work should be resumed.

Not until March 21, 1895, did I receive notice that the wells were sunk and the work nearing completion. On the 22, I made the inspection, and would report that the water supply comes from five wells within a radius of about eight feet, and from these is pumped to the stand pipe and water mains. The wells are about four hundred feet from Ross run and are sunk through strata of clay, sand and gravel to a depth of from 115 to 118 feet.

Although I went prepared to collect samples of water for analysis, I did not consider it necessary to have an analysis made by this Board for the reason that the water works authorities had already had it done by Dickore & Morgan, analytical chemists, of Cincinnati. A copy of the analysis is given below:

CINCINNATI, *June* 16, 1894.

MR. GEORGE HORNUNG, *C. E.*:

DEAR SIR: The following is the analysis of the St. Bernard well water:

100,000 parts of the water contains:

Free ammonia,	0.0165.
Albuminoid ammonia,	0.0160.
Nitrites no reaction by zinc—Iodide starch.	
Nitrates,	0.3220.
Clorine,	1.1916
Total solids,	48.8570 of which are
Mineral matter,	40.5240 and
Organic and volatile,	8.3330

The mineral matter is composed of calcium, magnesium, sodium, potassium and some alumina in combination with carbonic acid, sulphuric acid and chlorine, also some silica.

The carbonate of calcium and magnesium are predominant, while there also are small quantities of the sulphates of both. Most of the chlorine is apparently in combination with sodium as common salt.

Yours truly,

(Signed) DICKORE & MORGAN.

The above analysis shows that while the water is not of the best it is sufficiently pure for domestic uses and is, no doubt, much better than the

shallow wells that are now the chief reliance of most of the citizens. I would therefore recommend that this Board approve the source of water supply for St. Bernard.

COLUMBUS, OHIO, *April* 3, 1895.

DR. S. B. HOWARD, *Health Officer, St. Bernard, Ohio*:

SIR: The State Board of Health has considered your application to approve the proposed water supply of your village, to be obtained from a number of deep wells located about 400 feet from Ross run, and the same is hereby approved.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON PROPOSED WATER SUPPLY FOR WAPAKONETA.

BY E. T. NELSON, A. M., M. D., PH. D., AND R. D. KAHLE, M. D.

To the State Board of Health:

In answer to telegrams from the secretary of this Board, we went as a committee to Wapakoneta, Ohio, on Saturday May 4, 1895, for the purpose of examining into a proposed water supply for that town. We now desire to make the following report:

The supply is to be obtained from a series of eight or more wells, dug to an average depth of nearly forty feet, and so connected by pipes as to be worked by a single pumping station. The site selected is a small area of valley land adjoining the river, north of the main street of the town and directly west of the electric light station. Eight wells were dug by order of the city council some two or more years ago, but owing to questions of authority of the council to undertake such a work, and objections on the part of many citizens to the proposed site, nothing more has been done with the project until the present spring. By this time many of the wells had become more or less closed by means of a fine clay and sand which packed against the filter screens. Still more unfortunately, all records of exact depths, or of the thickness and character of the several layers of soil and clay passed through had been lost. The present board of water works trustees having determined to make a full and honest investigation of the site and the supply of water found there, secured the services of Mr. George Horn, C. E., of Cincinnati, as engineer, and also the services of Mr. E. A. Bolus, of the same city, an expert well digger. At the present time experiments are being made on two of the eight wells. It should be stated here, that when the wells were first dug, and with the imperfect piping and screening, the water rose to the top of the pipes, and even poured over the sides of the pipes in a constant

stream. It may be stated here also, that the top of the several pipes is many feet above high water mark in the river, proving that the supply has no connection with that body of water.

Messrs. Horn and Bolus first gave their attention and study to what may be called in this report "Well Number 1." It was so cleaned and enlarged as to give an opening perhaps one foot in diameter, down to the water bearing sands. The amount of water obtained from this well (with the addition of an unknown amount from "Well Number 2," which has not as yet been cleaned or enlarged) was about 300 gallons per minute, or 432,000 gallons every twenty-four hours, being much more than the probable demand of the town for many years to come. During the preparation of this well and in general prosecution of the subject, the character of the several layers of soil, sub-soil and rock were ascertained with very great accuracy. The section is as follows: Six feet, soil and clay; five feet, dark clay; ten feet, conglomerate rock; twelve feet, blue clay; seven feet, water bearing sand and gravel; and a layer of unknown thickness, too hard for working with the hand tools used.

It is seldom that we are called upon to report natural conditions better than those found here. With the layer of clay and conglomerate rock, we have the means given us of shutting off all surface water, while the very hard layer below the water-bearing sands will protect the supply as completely and confine it within certain definite limits. A very interesting problem in geology confronted us, and has for some time interested the engineer, viz.: Where is the source of the water supply? Remember that the wells are located in a valley only slightly above the river; there is no high land within the town from which to get a head sufficient to lift the water more than thirty-five feet. The head may be at some distance. We found the board of trustees attempting to solve the question of supply. This seems to be satisfactory by the tests shown. The question of the sanitary condition must next be attended to. We collected three gallons of the water from "Well Number 1," and shipped it by express to Prof. C. C. Howard, and await his analysis. An alleged analysis was given us, but without any statement as to the well from which it was taken or under what circumstances it was collected. The analysis was made by Wahl and Henius, for the Chicago Brewers' Association, and was as follows, the results being given in parts per million:

Lime carbonate	226.00	Total solids	448.0
Lime sulphate	102.6	Free ammonia	0.48
Magnesium carbonate	42.7	Albuminoid ammonia	0.20
Sodium chloride	6.0	Oxygen required	2.20

The combination of lime and magnesium salts would seem to indicate with a good deal of confidence, that the source of the supply is

within the geological formation known as the "water lime." If that is correct, the presence of the common salt is at once explained.

While withholding any approval of this supply until after the report of the chemist has been placed in our hands, we can very properly call attention to some other matters connected with the case. As fully stated before, these wells have been placed in a low valley. We estimate, without measurements however, that the surface of the ground is at least twenty-five feet below the level of the street to the south, and at least ten feet below the level of the street to the north. It must be fifteen feet below the grade of the railroad tracks just a few hundred feet to the east. It will be very easy to spoil the best water in the world by such surroundings if surface waters are allowed to enter the well or in any way mingle with the waters from the protected source. During our visit we observed a small stream of surface water trickling from a point two or three feet below the surface into the depression in which "Well Number 2" is located, and as if to still further mark the surface dangers one of the gentlemen who was showing us all points connected with the problem was constantly expectorating into the same depression. The elevated land to the south, and just in the rear of the Home Flour Mill, seems to be the dumping ground for all the old cans, bottles and other trash collected from the streets and yards of the town. So far as it has reached its street level it has become the hitching ground for farmers and others who have brought their teams into Wapakoneta. All that should be changed, independently of any relation to this investigation of a water supply. The bank might be graded and covered with sod and thus made into an attractive outlook. For the most part the river protects the site under investigation from pollution from the town.

The time at our disposal, and the stage of the investigations, will not warrant any definite statements as to the probable uniformity of the water in the several wells. As stated, the work is confined to wells one and two. The others have been disconnected for the present. We had caps removed from the wells in the lower portion of the field, and found that the water stood within fourteen inches of the top, even while a well less than two hundred feet away was delivering water at the rate of 300 gallons per minute, according to the estimate of Mr. Horn, the engineer, made during our presence. All of these wells, according to the "best remembrance" of the citizens, went down to the sand. It is probable, but by no means settled by evidence.

In closing, we wish to thank the trustees, Messrs. Mosier, Wilson and Haman, for many favors, and also Engineer Horn, Mr. Bolus and their assistants.

Professor Howard's report being satisfactory, we recommend the approval of the plan for the water supply of Wapakoneta.

Prof. Howard's report is as follows:

COLUMBUS, OHIO, *May* 10, 1895.

DR. C. O. PROBST, *Secretary of State Board of Health:*

DEAR SIR: Following are the results of the sanitary analysis of sample of water received from Wapakoneta, O., May 6:

Parts per 100,000.

Oxygen required.	Free ammonia.	Albuminoid ammonia.	Organic ammonia.	Nitrous acid.	Nitric acid.	Chlorine.	Total solids.
.10	.041	.003	.005	none.	.024	.30	46.4

Temporary hardness.	Permanent hardness.	Total hardness.
34.4	6 6	41.0

The very low figures found for all the constituents, except free ammonia (and total solids) taken in consideration with the large amount of the free ammonia, furnish very satisfactory evidences that this is a deep well water of a very considerable degree of purity. The free ammonia, much larger than would be permissible in a shallow well, or rather which in a shallow well would almost certainly be found accompanied with considerable quantities of the other constituents arising from, and showing the presence of organic matter in a state of decomposition, in this water must be regarded as arising from inorganic sources, the nitrates.

The hardness is some higher than is quite desirable, but this is balanced in part at least by the satisfactory quality of the water.

Yours truly,

CURTIS C. HOWARD.

COLUMBUS, OHIO, *June* 24, 1895.

MR. HENRY MOSIER, *President, Water Works Trustees, Wapakoneta, Ohio:*

DEAR SIR: At the recent meeting of the State Board of Health, held in Toledo, the proposed water supply for your city was approved.

Yours truly,

C. O. PROBST, *Secretary.*

PUBLIC WATER SUPPLIES IN THEIR RELATION TO PUBLIC HEALTH.

C. O. PROBST, M. D., SECRETARY STATE BOARD OF HEALTH.

Read at a sanitary convention held in Cleveland, September 27, 1895, under the auspices of the Cleveland Medical Society.

MR. PRESIDENT: In the early settlement of this country the finding of a living spring of pure flowing water frequently determined the location of a future village or city. In all times there has been common knowledge that pure water is essential to health. Nature has kindly looked after man's wants in this direction, and has filled the ground with water and prepared a filter in the upper layers of the earth to re-

move all impurities from it. We still find in wells and springs, when unpolluted by man, perfectly pure water, cool and refreshing to the taste, and free from germ life. In cities the soil becomes overburdened with filthy matters; cess-pools and vaults—abominations which common decency should have never allowed—abound and the wells become polluted and dangerous to use. Increasing demands for water finally lead to the introduction of water works, and a convenient river or lake is made to furnish the supply. Vast quantities of filthy substances are washed into the rivers and carried to the lakes, but still nature's protecting hand, by a series of changes, chemical and biological, converts these substances into harmless inorganic compounds. But as there is a limit to the purifying properties of the soil, so is there also to that of water, and a time comes when the rivers and lakes, especially near the sources of their pollution, no longer afford a safe water supply. Such is the condition of many cities to-day.

When this time comes for any city one of three things must be done, if any regard is to be had for the life and health of her citizens. First to stop the pollution of the water supply, second, to purify it, or third, to secure a new and purer supply. Often the greatest safety will lie in adopting two of these measures—to protect the water as far as possible, and in addition to purify it.

What evidence is there that impure water may cause disease? We have it from Mark Twain that many a man has come to an untimely end, by using bad water—in his whisky; and the list of diseases which have been attributed to impure water is quite a long one.

It was formerly believed that the presence of decomposing organic matter in water was the chief element of danger. We still measure the amount of dead organic matter in water, not so much because it may itself possibly produce disease as for the reason that water rich in such substance—especially when of animal origin, as from sewage—is very liable to contain *living organisms* of microscopic size which are the real source of danger.

River and lake waters usually swarm with germs or bacteria, a glassful often containing millions of them; but this need not alarm us, for all of these may be harmless. Indeed they are usually beneficial, for these minute growths that ordinarily inhabit water are true scavengers, removing from the water much of this dead organic matter, which is objectionable, if not dangerous. We shall have a true idea of bacteriology if we consider that the unseen part of the vegetable kingdom—these bacteria—are comparable to the visible part of vegetation. There are a few poisonous plants which man must destroy or avoid. So there are a few of

the many different species of bacteria which are pathogenic or disease producing, and these we must also destroy or avoid.

The list of disease producing bacteria which get into water is not a very long one. Dr. Sternberg describes sixteen, while Professor Frankland, in his late work on micro-organisms in water, enumerates twenty-three species of such bacteria. Most of these are only rarely present in water, and so far as we know there are but two diseases which can be properly called water borne diseases; these are Asiatic cholera and typhoid fever. It is highly probable that diarrhœa and dysentery are frequently conveyed through the water supply, and a few other diseases may be, but these will not now be considered.

Cholera possibly may be thought to be of little moment as it so seldom prevails here; but it has recently been knocking at the Golden Gate on the Pacific; and it may be laid down as a rule that any city suffering from a high typhoid fever death rate, due to a polluted water supply, will be in very great danger if cholera should pay us a visit.

Time will not permit of producing all the arguments advanced to prove that typhoid fever is usually a water borne disease, but it may be accepted that a very large majority of all cases are contracted in this way.

It is in fact laid down as a rule that the number of deaths from typhoid fever in any city is usually a fair measure of the purity or impurity of its water supply. This makes the study of typhoid fever of the greatest importance in connection with public water supplies.

It will not be amiss, to clearly understand the subject, to briefly consider the specific cause of typhoid fever. It is the belief of physicians and bacteriologists that the excreta of a person suffering from typhoid fever contain a micro-organism which is capable of producing the same disease on gaining access to the intestinal canal of another person. It is highly probable that it does not always produce disease when swallowed, and that a certain but unknown number of these organisms must be taken into the system to cause sickness. The typhoid bacillus, as might be inferred, finds in the body the conditions most favorable for its growth. A question of very great importance is, will it live outside of the body for any length of time, and if so, will it grow and multiply, so that a few germs getting into water may produce many? This question cannot be positively answered. It is probably true that under certain conditions—mostly artificial—this germ may multiply outside of the human body, but there is reason to believe that this seldom takes place, and especially in surface waters such as lakes and rivers. But while they do not ordinarily multiply, they undoubtedly may live some time in water, milk, or in the soil. They have been found in ice, so that freezing does not destroy them. Experiments made at the Lawrence, Mass., Experiment Station

proved that they existed for twenty-eight days in unfiltered Merrimac river water. We may state positively that when the germs of typhoid fever gain access to a supply of drinking water they may live and remain active for at least two weeks—a period sufficient in many cases to produce serious mischief.

It is easily understood how water suppplies become contaminated with typhoid fever germs. They get into wells by leachings from cesspools and vaults, and into rivers and lakes by the sewage discharged into them. This pollution may be temporary, resulting, possibly, in a great and sudden outburst of the disease, or it may be more or less continuous, and one might almost say premeditated, in view of present knowledge, causing a continuously high death rate from the disease. A familiar example of the former is the epidemic which occurred at Plymouth, Pa. Here the stools of a single case of typhoid fever, washed by melting snows into the city's impounding reservoir, resulted in 1,104 cases of the disease and 114 deaths. Examples of the other kind, of the more or less continuous prevalence of typhoid fever due to drinking a sewage laden water, may, unfortunately, be found on all sides.

First, that we may have a basis for comparison, let us consider the prevalence of typhoid fever in a few of the cities which have a naturally pure water supply, or one which is purified by artificial means.

In 1893, London had 719 deaths from typhoid fever, which equals seventeen per 100,000 inhabitants. London obtains its supply almost entirely from the Thames and Lea rivers, both of which are subject to pollution; but all of this water is filtered, and repeated examinations have shown that nearly ninety-nine per cent. of all micro-organisms in the river water is removed by the filters. Berlin in the same year had 161 deaths from typhoid fever, or nine per 100,000 inhabitants. Berlin is also using a dirty river water supply, but filters it, and removed on an average of 99.6% of all bacteria during that year. Vienna, using pure spring water, had but seven deaths per 100,000 inhabitants from typhoid fever in 1893.

Taking some of the cities of the United States for the census year 1890, when the population is known, and we find in a list of fifty of the largest cities not one with as low a rate as London, with her seventeen per 100,000 population. Alleghany City, which we know has a badly polluted water supply, had 217 typhoid deaths per 100,000 inhabitants. New Orleans is at the other end of the list, with but nineteen per 100,000. Looking to Ohio, where our greatest interest lies, and we find twenty-five for Dayton, with a water supply from wells, thirty-nine for Toledo, with water from the Maumee river, forty-three for Columbus (and a part of the year our water supply is badly polluted), fifty-one for Cincinnati

(where I suspect few people drink water, other beverages being so abundant and the water so bad), and sixty-three per 100,000 inhabitants in your own city of Cleveland.

But it is hardly fair to judge this matter from a single year, when exceptional conditions may have been present in one or the other of these places. Taking a period of seven years ending with 1894, and the reports of deaths made by the local boards of health, and we find, stating the matter in another way to avoid questions as to increase of population—that in Toledo and Dayton 1.99 and 2.02 per cent. respectively of all the deaths were due to typhoid fever. In Cincinnati it was 2.78 per cent., in Cleveland 2 97 per cent. and in Columbus, to our shame be it said, 3.87 per cent. of all deaths in that time were due to typhoid fever. Two thousand eight hundred and eighty-two deaths have occurred from typhoid fever in these cities in the past seven years. And this is not all of it, for undoubtedly many people who contracted the disease in these places died elsewhere.

Many authorities tell us we should multiply the deaths by ten to arrive at the number of cases. That is, that about one in ten of those who have typhoid fever die of the disease. Doing this, and it appears that we have had about 29,000 cases of typhoid fever in Ohio's five largest cities in seven years. If, as we believe, fully three-fourths of these cases could have been prevented by furnishing the people pure drinking water, is it not time that ways and means were found to guard against this needless sacrifice of life and health in the future?

Let us look at one or two examples showing how this may be done, and which at the same time strengthen the claim that typhoid fever is a water borne disease.

Prior to 1893 the water supply of Chicago was notoriously bad. During a part of the time a portion of the supply was taken from a short tunnel into Lake Michigan, known as the shore inlet, and intended for fire emergencies only. This supply was badly polluted by sewage from the Chicago river, as was also, at times, a supply obtained from a crib farther out in the lake. In the year 1892 there were 1,498 deaths from typhoid fever in Chicago, or 103 per 100,000 inhabitants. In December of that year this shore inlet was closed and a large part of the supply was taken from the new four-mile tunnel. In 1893 there were forty-one per 100,000 inhabitants and in 1894 but thirty-one, which was 2.05 per cent. of the deaths from all causes, and the lowest rate in any year since 1851.

The city of Frankfort, Germany, affords a striking example of what may be done by engineering works in reducing the deaths from typhoid fever. Prior to 1867 the city was using a badly polluted water supply and was practically without sewerage. The yearly deaths from typhoid

fever ranged from 100 to 110 per 100,000 inhabitants. Sewerage works were commenced in 1867, and a pure water supply was introduced in 1872. In 1875, when fifty-two per cent. of the houses were joined to the new water supply and forty-three per cent. of the houses to the sewers, the typhoid fever deaths had fallen to forty-two per 100,000 inhabitants. Ten years later, when eighty-four per cent. of the houses were joined to the new water supply and seventy-seven per cent. to the sewers, there were thirteen deaths in the year from typhoid fever; while for 1893, ninety-eight per cent. of the houses being supplied with pure water and ninety-six per cent. connected with the sewers, there were but four deaths from typhoid fever per 100,000 inhabitants. You will note that for each period the per cent. of decrease of typhoid fever deaths corresponds closely with the per cent. of increase in the use of pure water.

It has already been noted that Chicago was able to reduce her typhoid rate by more than sixty per cent. by going farther into the lake for water. Examples can be given to show that equally good results may be obtained by the artificial purification of a polluted water supply; and it is fortunate that this is so, for many cities are unable to secure naturally pure water.

Lawrence, Mass, is on the Merrimac river, which receives the sewage of Lowell, only nine miles above. Both cities have suffered severely from typhoid fever, and an epidemic in Lowell always meant an epidemic in Lawrence. Both cities used unfiltered Merrimac river water. In Lawrence, for five years prior to the introduction of filtered water the average number of deaths from typhoid fever was 127 for 100,000 inhabitants. Since September, 1893, all the city's water has been purified by sand filtration, and in the year following the typhoid deaths dropped to thirteen per 100,000, a reduction of sixty per cent. Lowell, during that time suffered from an epidemic of typhoid fever, and infected sewage must have been discharged into the river only nine miles above Lawrence's filter beds.

I cannot refrain from citing an example, though it must be familiar to many of you, which shows in the most striking manner the difference, with respect to production of cholera, in those using a pure and impure water supply.

Hamburg and Altona both obtained public water supplies from the river Elbe, Altona at a point seven miles below the discharge of the sewage of both cities, and Hamburg seven miles above. Elbe is a tidal river, and sewage is undoubtedly at times carried to Hamburg's water intake. The cities are practically one, separated only by an imaginary line. The people were living under the same conditions, except that the citizens of Hamburg were drinking an unfiltered river water, while

the water for Altona was filtered, when the last cholera epidemic made its appearance in Hamburg. Nearly 17,000 cases and over 8,000 deaths occurred from the disease in Hamburg, or over twenty-six cases for each 1,000 inhabitants. In Altona, where the water supply, except for filtration, was infinitely worse, receiving all of Hamburg's sewage and its own, there were less than four cases per 1,000 inhabitants. Prof. Koch, who investigated this epidemic to determine the efficiency of sand filtration of water supplies, reported that nearly all of the cases in Altona had been contracted in Hamburg, and that the filters had proved an efficient barrier against the disease.

There is another lesson to be learned from Hamburg's experience. The health authorities had repeatedly called attention to the danger of using such a water supply, but the matter was allowed to drag along until the year 1891, when the construction of filters was commenced. But the cholera came in 1892, before the works could be completed, and nearly 10,000 citizens paid the penalty of this procrastination with their lives.

Bringing this question home to the city of Cleveland, it is apparent that the present water supply is far from what it should be, although other cities may be worse off. But you are to be congratulated on having now taken steps to secure purer water. Each of you should feel that the purest water that money and engineering skill can obtain is none to good for a Clevelander.

London, though having a filtered water supply of much greater purity than that of most American cities, is seriously considering the expenditure of £38,000,000 to secure still better water. Boston has accepted plans and estimates calling for $30,000,000 for a larger and better water supply. Whole villages will be bought and removed from the water shed in order to preserve the water's purity. Cleveland, with a perfectly pure water supply, and the satisfactory disposal of her sewage, will have cast off a very great impediment in her progress towards becoming the first city of the lakes.

Permit me to add one word as a representative of the State Board of Health. In 1893 the Ohio Legislature enacted a law providing that no city or village should introduce, change or extend a public water supply or sewerage system without the approval of the State Board of Health. This act is in line with what has been done in Massachusetts, New York and Minnesota, but it is far short of the powers conferred upon the boards of health of the two former states. The intention of the act is obvious, and its proper enforcement will tend largely to prevent arising the deplorable conditions now existing in many of our cities and towns. In some in-

stances the Board has, perhaps, appeared at first sight in the light of an obstructionist to needed public improvements, but I can say with the greatest sincerity that in all of its acts it has been guided by the sole desire to give the people the best attainable conditions for the preservation of health.

ANALYSES OF PUBLIC WATER SUPPLIES OF CITIES IN OHIO.

SAMPLES COLLECTED IN SEPTEMBER, 1895.

Number.	City.	Source.	Turbidity.	Sediment.	Color.	Oxygen required.	Free ammonia.	Albuminoid ammonia.	Nitrogen as nitrites.	Nitrogen as nitrates.	Chlorine.	Total solids.	Fixed residue.	Loss on ignition.	Temporary hardness.	Permanent hardness.
1	Cincinnati	Ohio river	Decided	Considerable	.2	.24	.0024	.0144	.0006	.0250	2.76	17.9	12.6	5.3	5.8	4.2
2	Sandusky	Sandusky bay	Very slight	Very slight	.1	.232	.0076	.0168	.0002	.0131	.49	16.8	12.3	4.5	11.2	4.9
3	Toledo	Maumee river	Distinct	Considerable	.4	.916	.0062	.0348	.0000	.0185	2.38	38.4	26.6	11.8	18.3	8.1
4	Columbus	Wells and Scioto river	Very slight	"	.8	.112	.0368	.1068	.0000	.0078	.26	62.9	51.6	11.3	36.9	13.7
5	Ashtabula	Lake Erie	None	None	.0	.208	.0088	.0078	.0000	.0250	.45	16.1	11.9	4.2	11.3	4.7
6	Portsmouth	Ohio river	Decided	Considerable	.2	.280	.0048	.0116	.0000	.0135	4.65	20.7	16.1	4.6	5.4	5.8
7	" (well)		None	None	0	.072	.0082	.0082	.0012	.0735	4.30	59.5	46.2	13.3	31.9	11.6
8	Ironton	Ohio river	Decided	Considerable	.3	.304	.0041	.0136	.0009	.0175	4.58	23.5	18.6	4.9	5.6	5.6
9	Lorain	Lake Erie	None	None	.0	.192	.0018	.0102	.0000	.0065	.36	15.7	9.1	6.6	9.6	5.0
10	Steubenville	Ohio river	Very slight	Slight	.3	.256	.0066	.0152	.0002	.0311	4.93	24.2	16.7	7.5	4.6	9.0
11	Bellaire	"	"	"	.3	.232	.0082	.0188	.0003	.0340	4.79	27.8	19.6	8.2	4.7	9.4
12	Findlay	Blanchard river	None	None	.4	.780	.0164	.0576	.0003	.0250	.57	48.9	33.6	15.3	19.1	22.2
13	Mansfield	Artesian wells	Very slight	Slight	.0	.116	.0052	.0054	.0000	.0467	.78	43.6	32.4	11.2	21.3	8.3
14	Canton	Deep wells	None	None	.1	.276	.0058	.0162	.0004	.0350	.38	32.2	22.8	9.4	18.2	8.1
15	Chillicothe	Well	"	"	.0	.108	.0130	.0058	.0000	.0250	.70	43.3	28.2	11.1	24.0	8.5
16	Lima	Wells and Loss creek	"	"	.0	.120	.0028	.0118	.0000	.0183	2.74	104.2	80.2	24.0	41.2	35.8
17	Hamilton	Wells	"	"	.0	.068	.0072	.0048	.0001	.0150	.64	34.7	22.4	12.3	26.7	2.8
18	Dayton	"	"	"	.0	.108	.0012	.0062	.0006	.0233	.70	44.4	33.8	10.6	27.9	8.9
19	Tiffin	"	"	"	.0	.312	.0072	.0090	.0005	.0216	1.06	43.8	35.1	8.7	23.6	16.2
20	Massillon	"	"	"	.0	.052	.0056	.0046	.0000	.0083	.56	33.0	26.7	6.3	22.5	7.6
21	Youngstown	Mahoning river	"	"	.0	.364	.0012	.0184	.0000	.0300	.91	26.1	18.9	7.2	11.5	6.4
22	Circleville	Filter galleries	"	"	.0	.688	.0132	.0074	.0002	.0300	.42	39.1	28.9	10.2	29.4	4.1
23	Zanesville	Muskingum river	Heavy	Much	1.3	.568	.0030	.0218	.0000	.0816	.53	27.9	20.0	7.9	8.7	8.2
24	Marietta	Ohio river	None	None	.0	.248	.0028	.0158	.0001	.0616	12.83	41.7	37.8	3.9	4.5	12.6
25	Delaware	Well and Olentangy river	"	Slight	.2	.456	.0010	.0264	.0000	.0150	.64	53.1	38.3	14.8	20.7	14.1
26	Painesville	Lake Erie	"	None	.0	.084	.0004	.0106	.0001	.0083	.34	16.8	12.0	4.8	10.9	4.8
27	Springfield	Well	"	"	.0	.048	.0022	.0026	.0000	.0121	.29	40.2	32.4	7.8	30.8	5.9
28	Cleveland	Lake Erie	"	"	.0	.140	.0026	.0104	.0000	.0160	.31	14.9	9.7	5.2	9.8	2.2
29	Newark	Wells	"	"	.0	.104	.0022	.0078	.0000	.0121	.14	28.9	21.7	7.2	20.4	5.9

SEWERAGE SYSTEMS.

REPORT ON THE SEWERAGE OF ASHLAND.

BY JOSIAH HARTZELL, PH. D.

Mr. President: During my stay at Ashland, Dr. Benjamin Myers, Health Officer, made known to me some objectionable matters pertaining to the sewers of the village, or rather to the use that is made of them. Upon inquiry the following general situation was established.

There are two sewers: One is a brick arched sewer about 2,500 feet long. The bottom is flat, two feet wide, the arched brick top having a radius of about one foot. Some of the householders having urgent need of sewerage facilities have connected their privy pits to this sewer. The other sewer is a tunnel of stone, about two feet square, and the same has therefore also a flat bottom. It is about half as long as the brick sewer.

The discharge of these sewers is into a brook which has its channel through the village. Their courses, from the brook to their upper ends, are under the most thickly populated districts. The health officer complained, and certainly with apparent justice, that the sluggish flow of excrement and urine over the rough, flat bottoms of these sewers, especially in the absence of frequent and periodic flushing with clean water, constituted a standing menace to the health of the contiguous population. It is believed that house sewage is not admitted into the square stone sewer, but both sewers receive the wash of streets, and the latter is by no means free from substances which, when detained for a time which permits fermentation, are quite capable of producing unsanitary conditions.

At the time of my visit, March 7, the wet weather flow of the brook exhibited a considerable volume, but Dr. Myers, and other citizens as well, assured me that in times of low water there was almost no flow at all; also that by reason of the effluent, from the arched sewer particularly, the bed of the brook was sometimes brought into a very foul-smelling and offensive condition.

In the first place it is to be much regretted that so much money was spent in building these two sewers in a manner which flagrantly violates established precedent in all good drainage work. If only storm water is admitted through well trapped catch-basins, and with careful inspection

and maintenance of the latter, the disadvantages necessarily accompanying their use will be reduced to the minimum.

Second: It is the duty of the local board of health to keep these sewers exempt from the pollution of house wastes and excrement. It would also be much better if their contents were delivered into the open channel at a point below, and beyond the limit of the inhabited district.

Third: A 12-inch, or at most a 15-inch main house sewer would suffice for the sanitary drainage of the village. Vitrified stoneware pipes are both the best and cheapest material. The cost of such an improvement would probably be much less than seems to be popularly apprehended. Rain water should not be admitted; and it is important that the effluent be not allowed to pollute a water-course. All this, accompanied by the best of sewerage service, is quite within the compass of good sanitary engineering. With the main built at the general expense, the laterals could be built and extended from time to time as required, and they could be paid for by the abutting and directly benefited property. The water works will render the need of house sewerage very urgent.

The above observations are offered in the way of suggestion, also in the interest of the future sanitary welfare of the village. The continuous storage of human wastes in shallow pits is a practice fraught with danger, and is liable to induce surroundings which would need only a match tipped with the germ of some malignant contagion to insure the paralysis of that prosperity and content which now impress the eye and leave a pleasant memory to the visitor to the beautiful village of Ashland.

COLUMBUS, OHIO, *April* 3, 1895.

To the Board of Health, Ashland, Ohio:

GENTLEMEN: A report upon the sewerage of your village was made to the State Board of Health on March 28, and by instruction of the Board I send you a copy, which please find enclosed herewith.

Respectfully,

C. O. PROBST, *Secretary.*

COLUMBUS, OHIO, *April* 3, 1895.

To the Mayor and Council, Ashland, Ohio:

GENTLEMEN: A report upon the sewerage of your village was made to the State Board of Health on March 28, and I was instructed by the Board to send you a copy, which please find enclosed herewith.

Yours truly,

C. O. PROBST, *Secretary.*

REPORT OF ADDITIONAL SEWERAGE PROPOSED FOR THE CITY OF CINCINNATI.

BY BYRON STANTON, M. D.

To the State Board of Health:

GENTLEMEN: A communication from Mr. A. E. Tripp, Assistant Engineer in charge of the sewer department of Cincinnati, calls attention to the fact that plans have heen prepared for additional sewers in that city, and asks for action of the State Board of Health on the same.

I would say that I have examined the plans, which are for one new sewer and five extensions of sewers partly built, and respectfully submit this report and the accompanying map of Cincinnati and part of Hamilton county, showing the proposed work. It will be seen that the plans contemplate—

First. The extension of the Crawfish creek sewer, a sewer which will receive the sewage from a large territory in the eastern part of the city and soon, by contemplated extensions, from adjacent corporations, and discharge into the Ohio river less than four miles above the intake of the city water works. This sewer was built within the last two years without the approval of this Board, the municipal board having the matter in charge being ignorant of the law governing such matters. This extension will greatly increase the volume of sewage contributed to the water source of the city.

Second. A proposition for the construction of a new sewer in a ravine to the west of Torrence road, which would also discharge into the Ohio river, about two and one-fourth miles above the water works. It is to receive the sewage of a small but populous district and will greatly add to the contamination of the water supply.

Third, fourth and fifth. Propositions for extensions of sewers, already partly constructed, which discharge into Mill creek or some of its tributaries. How far the conversion of Mill creek into a great open sewer can be carried without detriment to the public health I am unable to say, but these extensions will add very little to the contamination of the stream which already receives the sewage of Avondale, Clifton, Cumminsville, Camp Washington, Lick Run, part of Walnut Hills and numerous other places in the Mill creek basin. The time is not far distant when all of the sewage will have to be carried by a grand trunk sewer to the river.

Sixth. A proposition for the extension of a partly constructed sewer in Bold Face creek, in the extreme western limits of the city, which will receive the sewage of the western part of Price Hill.

I would recommend that this Board not only refuse to approve of the extension of Crawfish creek sewer and the construction of the Torrence road sewer, but that it should enter a most earnest protest against such violation of sanitary law as is now being carried on by the discharge of the sewage into the Ohio river so near the water works as to cause contamination of the water supply. I would also suggest that the matter of the use of that part of Crawfish creek sewer already built be referred to the Attorney-General for report as to what steps this Board can take to prevent its use for water closet and house connections.

I would also recommend that this Board approve the plans for extension of the Carthage pike and Mitchell avenue, Bates run, Badgeley run and Bold Face creek sewers.

COLUMBUS, O., *April* 1, 1895.

MR. A. E. TRIPP, *Assistant Engineer, Cincinnati, Ohio:*

SIR: The State Board of Health has considered your application for approval of the proposed outlets of the following sewers, to-wit:

(a) Extension of Crawfish creek sewer.

(b) New sewer in ravine west of Torrence road.

(c) Extension of sewers in Carthage pike, Mitchell avenue, Camp Washington.

(d) Extension of sewer in Bold Face creek.

The proposed outlets of sewers a and b, i. e., Crawfish creek sewer and Torrence road sewer, are hereby disapproved; as it is the opinion of the Board that the discharge of raw sewage at the points indicated would endanger the public water supply of the city of Cincinnati.

The outlets of sewers c and d, i. e., sewers in Carthage pike, Mitchell avenue, Camp Washington and Bold Face creek, are hereby approved.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON SEWERAGE FOR CLEVELAND.

BY C. O. PROBST, M. D., SECRETARY.

OHIO STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY, COLUMBUS, O., *April* 9, 1895.

MR. WALTER P. RICE, *Chief Engineer, Cleveland, Ohio:*

SIR: The State Board of Health has considered your application for approval of two additional sewers to discharge into Lake Erie, and I am instructed to make you the following report:

The sewer by which it is proposed to drain West Cleveland and a portion of an adjoining town, will discharge into Lake Erie at a point two miles, more or less, southwest from the present intake of the water supply of Cleveland. As it is reported that the prevailing currents of Lake Erie are from west to east, the Board is of the opinion that the discharge of sewage at the point proposed would be likely to add additional polluting matters to the water supply of your city, and is therefore objectionable.

The sewer by which it is proposed to drain a part of the easterly portion of Cleveland and the town of Glenville, is to discharge at Doan street at the same point from which, we are informed, it is proposed to build a tunnel for the purpose of securing additional water supply. The outlet of this sewer is five miles, more or less, from the present water works intake, and east of it, so that the prevailing currents of the lake would tend to take the sewage away from, rather than towards the intake. As there are already a large number of sewers in this direction, and nearer the water works intake than the proposed sewer, this sewer is not in itself particularly objectionable, so long as the present water works intake only is concerned; but in view of the probable construction at some future time of the new water works intake near this point, the construction of this sewer is deemed to be objectionable.

The Board recognizes that the districts to be served by the proposed sewers require to be provided with sewerage facilities, but an effort must be made to do this in a manner the least detrimental to public health.

The Board is convinced that the present sanitary condition of Cleveland is not as good as it should be. Sewage is discharged into the lake, or into the river flowing into the lake, at forty-eight points, and the water supply is taken from the lake by means of a tunnel to an inlet crib, only one and one-fifth miles from the points at which large quantities of polluting matters are discharged. The continued occurrence of a large number of cases and of deaths from typhoid fever in the city for many years, is evidence that the water has been, and is, so polluted as to be injurious to health.

From our investigation we have been unable to find that there is any comprehensive scheme by which the water works and sewers are to be extended, and until such general project has been adopted, it is impossible to properly consider the advantages or disadvantages of particular minor projects. The Board therefore recommends that adequate measures be taken to secure a study of the whole problem of water supply and sewerage for the city of Cleveland, broad enough to meet the requirements of the city for many years to come.

Three lines of work present themselves by which the city can improve the present conditions: First, by securing greater dilution of the sewage which may enter the water supply. The position of the outlets of the sewers, or of the water works intakes, may be so changed that the distances between the point or points of pollution and the intake of the water will be greater, and the dilution of the impurities will be correspondingly increased, and the danger to health lessened. Extending the present water works intake to a distance of four miles from the shore, and constructing a new intake opposite Doan street at the same distance, will undoubtedly effect a great improvement in the condition of the water supply. But it is not clear that this treatment will be adequate to meet the requirements of the greater city, which we must expect Cleveland to become in the future.

Second, by preventing the discharge of raw sewage into the lake. It has been suggested that the sewage might be kept out of the lake by the construction of intercepting sewers, which would discharge the sewage at a more remote point, and would allow it to be treated and purified before being discharged into the lake.

Third, by purifying the water supply by means of filtration. The water supply of the city might be filtered through sand filters, as is done by a large number of great European cities, and if properly carried out a water polluted no more than the water now drawn from the crib could be so purified as to be entirely suitable for domestic use.

The Board is unable to decide from the information now available which of these three methods of procedure would be likely to yield the most satisfactory results, or whether two of them, or even all three should be used in conjunction.

Such a decision could only be reached after careful study of the local conditions and the preparation of plans in more or less detail for various projects, as suggested above; and the Board would recommend that such investigations should be undertaken at once, by the city of Cleveland, and that suitable plans should be prepared and adopted

to improve the condition of the river, lake and water supply. After this is done, the question of providing sewerage facilities for West Cleveland, and for the section at the east of the city can be decided in a satisfactory manner. The Board believes that the construction of the two proposed sewers is not so urgent, but it will be better to allow their construction to wait until after such an examination has been made, rather than to incur additional expenses in extending the present objectionable system in a way which may result, when comprehensive plans are adopted, in the loss of a part of the money spent upon them. The Board therefore disapproves of the sewers as now proposed.

Respectfully,

C. O. PROBST, *Secretary.*

OHIO STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
COLUMBUS, OHIO, *June* 24, 1895.

MESSRS. D. E. WRIGHT, *Director of Public Works;* H. L. ROSSITER, *Director of Accounts;* SAMUEL G. MCCLURE, *Secretary of Board of Control, Cleveland, Ohio:*

DEAR SIRS: The two following propositions were submitted by you to the State Board of Health, at a meeting held in Toledo, June 19, 1895:

TOLEDO, O., *June* 19, 1895.

To the State Board of Health:

The city of Cleveland respectfully requests the approval of your honorable body to the plan submitted for the extension of the present water works tunnel from two to two and one-half miles north of the present crib. Would state—

1. Plans for the new intake two and one-half miles further in the lake have been prepared.
2. These plans have been accepted by the city government.
3. They have been submitted to the United States government for approval.
4. Funds are on hand with which to commence the work.
5. The work will be commenced by advertising as soon as the consent of the United States government is secured.
6. The crib can be completed this fall and winter, ready to put in place in the spring.

TOLEDO, O., *June* 19, 1895.

To the State Board of Health:

The city of Cleveland respectfully requests permission to proceed with the construction of the so-called Highland Avenue and other sewers required for Sewer District No. 13 in the city of Cleveland, with an outlet for said sewer district at or near Waverly avenue, and with an overflow outlet at Highland avenue and at such other points as may be found most feasible.

(Signed) D. E. WRIGHT,
Director of Public Works.
H. L. ROSSITER,
Director of Accounts.
SAMUEL G. MCCLURE,
Secretary Board of Control.

Mr. Walter P. Rice, as Chief Engineer of Cleveland, submitted a proposition to the Board to discharge the sewage of West Cleveland, or Sewer District No. 13, at or near Highland avenue—a point southwest of the present intake of the city water supply.

After proper investigation, the Board reported: "As it is reported that the prevailing currents of Lake Erie are from west to east, the Board is of the opinion that the discharge of sewage at the point proposed would be likely to add additional polluting matters to the water supply of your city, and is therefore objectionable."

The outlet proposed near Waverly avenue (which you stated is a temporary expedient), is less objectionable, as under ordinary conditions sewage discharged at this point will be carried eastward, and will not reach the water intake. But it has been conclusively shown that persistent east winds, and possibly other causes, change the direction of lake currents so that sewage discharged farther east even than Waverly avenue may reach the present crib. Without the extension of the water intake it would be unwise, in the Board's opinion, to discharge additional sewage at the point proposed.

The fact that your present water intake is dangerously near to your outlet sewers, has been generally known for many years. Attention was forcibly called to this danger by your health department in the year 1886. On page 7, of their report for that year, we find "with all of our sewerage emptying into the lake or river, and from the latter often after weeks of practical stagnation, a serious and expensive proposition is presented in the interest of pure water for the future. And by some method the sewage of this city must be carried further from the point at which the supply of water is drawn, or serious injury is almost certain to result."

In 1887, a series of examinations of the water supply of the city was made. Commenting on these examinations the report of the health department for that year (page 9) states: "From all of the tests and observations thus far made, it is reasonable to conclude that the public water supply of the city is, for the most part, of excellent quality. The only exceptions occur when, under unusual conditions, the waters from Cuyahoga river are carried to the point of supply. Such occurrences are rare, but the possibility is beyond question, with manifest danger involved."

In the report of the health department for 1889 (page 12), we find, "A large number of cases and deaths have been reported, giving typhoid fever as the cause. The general distribution of this disease throughout the city, and through the year, leads to the conclusion, that the cause or causes were wide spread and continuous. Whether connected with the atmospheric, food, or water supply, there is certainly more reason to suspect the latter than either of the others, and the necessity for guarding our water supply is increased each year."

The annual report of your health department for 1892 (page 14), contains the following with reference to the pollution of the water supply: "There are portions of the year when the water of the lake is

comparatively free from impurities, and possibly may be drank with impunity, but its purity and fitness for drinking purposes cannot be relied on, for it is clearly demonstratable that at certain seasons of the year, especially in the spring, when a general break-up occurs in the river and lake, that our drinking water is freighted with impurities, is in fact so plain that he who tastes may read. Then, again, it has been demonstrated by actual and repeated experiments that the down current of the lake which is relied on to protect the locality of the crib from the unwholesome and polluting influences of the river and shore, is from time to time reversed by persistent east winds, thus subjecting the water flowing through the tunnel to those influences and dangers arising therefrom as effectually as though there was no down current of the lake."

In a recent special message of the present mayor of the city to council, your situation with reference to water supply and sewerage, and the urgency for immediate improvements, are admirably presented. We cannot refrain from quoting the following extract:

"For eight years or more there has been discussion concerning the need of intercepting sewers, but it has ended in talk. The present embarrassment is merely a culmination. It emphasizes the dangers that menace the health of the city, and calls attention to facts that will grow in force as the city increases in population. The progress of the western half of the city, so long as the source of water supply is unchanged and the sewer system in its present state, is a growing threat to the public health. The sewage of that rapidly growing section must of necessity empty either into the river or into the lake west of the river, unless a system of intercepting sewers is constructed with pumping stations that will allow the drainage of the west side to pass under the river, and then be pumped to a higher level and be carried east past the city limits. Without such intercepting sewers the drainage of that district is likely to pollute the water supply sooner or later, even if the present tunnel is extended two miles further into the lake. Its menace to the proposed east end tunnel is no less serious, yet the rapid growth in population and industrial greatness of Cleveland renders it imperative that plans be made now for a second source of supply. It will require from two to four years to complete an east end tunnel after the contract is let. At the present rate of increase in water consumption, the utmost capacity of the present tunnel will be reached by that time.

"It seems to me the situation calls for the wisest consideration and most prudent action, and that delay is hazardous. Cleveland cannot afford to hesitate when the health of the city is threatened, or allow matters to drift into a condition which may eventually impair the prosperity of the city. I believe the people stand ready to take up the burden of taxation that will have to be borne if this great question is to be solved in a manner which will be as satisfactory thirty or forty years hence as to-day."

It is not necessary to add anything to what has already been officially expressed by your own authorities, who are so thoroughly familiar with the situation, with reference to the danger of pollution of your water supply by sewage from the city. The time has surely come when a different policy must be pursued in disposing of your sewage. Past experience has also shown that your drinking water must be obtained at a greater distance from the shore. Whether water of sufficient purity can

be obtained from the lake two and one-half miles farther out than the present crib we are unable to determine, as no evidence on this point was presented. Examinations of lake water supplies at other places indicate that so long as sewage is being poured into the lake along the city front, there can be no guarantee that the lake water will not at times be contaminated even at this distance. It is questionable indeed whether our lake cities will not soon be compelled to purify their public water supplies to render them safe for domestic use. In a former report of the Board on this subject it was recommended "that adequate measures be taken to secure a study of the whole problem of water supply and sewerage for the city of Cleveland, broad enough to meet the requirements of the city for many years to come."

We are greatly pleased to note that the chief executive of your city, recognizing this need, has submitted an ordinance to the city council providing for the appointment of a sanitary commission "composed of experts of national reputation" to examine the sewerage system of the city and report the best methods of preventing the pollution of the water supply, the best manner of purifying the Cuyahoga river, and the construction of intercepting sewers, or some equally satisfactory relief.

On your assurance that the plans presented for the sewerage of West Cleveland, and for the extension of the water intake, will be made to harmonize with the findings and general plans to be reported by the expert sanitary commission, recommended by the honorable mayor of your city, the State Board of Health has voted to approve them, subject to their approval by the said sanitary commission.

You will be required, however, to furnish plans of Sewer District No. 18, showing size, grades and location of main and lateral.

REPORT ON THE PROPOSED SEWERAGE SYSTEM FOR THE COURT HOUSE AND JAIL OF DELAWARE COUNTY, LOCATED AT DELAWARE.

BY C. O. PROBST, M. D., SECRETARY.

At the request of Prof. Nelson, I visited Delaware August 2, to inspect the sewerage system proposed for the court house and jail in that city. I met Mr. C. F. Miller, County Commissioner, and Mr. E. S. Mendenhall, County Engineer, who has charge of the construction of the sewer.

Drainage from the court house and jail has heretofore been conducted to a cess-pool near the buildings. This was not water tight, and there has been some leakage of foul liquids which has caused trouble.

The county commissioners, being ignorant of the law requiring the approval of the State Board of Health, contracted for an eight-inch sewer, extending from the court house and jail to the Olentangy river, a distance of about twelve hundred feet. The work was almost completed at the time of my visit.

The point where the sewer is to discharge is just above the C., S. & H. depot, and just below a mill dam. There was a shallow pool of water at this point, but just below the river bed was almost entirely uncovered with water, but had a thick growth of weeds over it. Mr. Mendenhall kindly agreed to measure the stream, and under date of August 3, wrote as follows: "This morning I made a careful measurement of the flow of water in the channel of the Olentangy river by measuring the depth and width. The width of the channel we examined is eight feet—average depth of water in the channel, four inches. I floated a small piece of pine wood from a point forty feet above the narrow place we examined, and in twelve trials the average time was twenty-eight seconds. From the above data I make the flow of water in round numbers, thirty-four gallons per second, or two thousand and forty gallons per minute." This would equal a flow of nearly three millions of gallons daily. The river when measured was at its lowest stage owing to the long continued drought.

There are about twenty-five people in the court house and jail who will make daily use of the proposed sewer. There will be some use, but not a great deal, of the closets in the court house by outsiders. This will be greatest during court terms, but court is not in session from June to September, the time when the river is lowest and the weather warmest.

During June and July of this year 144,000 gallons of water have been used in the court house and jail. This is equal to about 2,400 gallons daily, which will be about the amount of sewage contributed to the stream daily during these months. With three million gallons minimum daily flow in the river this would give a dilution of over twelve hundred to one.

A public water supply was introduced into Delaware in 1889, but the city is still without a system of sewerage.

Two hotels have private sewers emptying into the river below the proposed outlet of the new sewer. Two or three other private sewers also discharge into the river. These have caused some pollution of the stream, and the odor of decomposing sewage was plainly perceptible at the river's edge where the sewage is deposited.

A complete system of sewerage for the city is badly needed. I was informed by different persons with whom I conversed upon the subject that there is a strong public sentiment in favor of sewerage, and that the

city would in all probability construct a complete system of sewerage within a few years. The commissioners agree to connect with the public sewers as soon as they are constructed. They further agree to permit no other connections to be made with the present sewer.

I am of the opinion that the proposed sewer will cause no trouble except, possibly, when the river is unusually low. At its present stage it is probable that there would be some detention and decomposition of sewage which would give rise to bad odors. There are, however, no dwellings on the banks of the river at this place. The owners of the mill near where the sewer will discharge, do not object to it.

I would recommend that the outlet of the proposed sewerage system be approved subject to the following conditions:

First. That connections be made with the sewerage system of Delaware as soon as a system is introduced.

Second. That the outlet sewer be taken to the middle of the river, and to a point where the stream is constantly flowing.

Third. That all growing weeds, grass, stones, sand or other obstructions to the flow of water at and immediately below the outlet of the sewer be removed.

Fourth. That the outlet must be so arranged, as above, as not to produce a nuisance. If one is produced, it must be removed by the county commissioners.

REPORT ON PROPOSED SEWERAGE SYSTEM FOR EVANSTON.

BY BYRON STANTON, M. D.

To the State Board of Health:

GENTLEMEN: The corporation of Evanston, Hamilton county, having made application to your Board for approval of a proposed system of sewers to discharge into Duck creek, I would respectfully report that on February 22, I examined the plans and specifications for said sewers and have personally gone over the ground with the view of determining upon the expediency of such an outlet.

Duck creek is a small stream, much of the year very nearly dry, running from the proposed point of discharge in a north-easterly direction for about two miles, then east nearly the same distance, then south-east to the Little Miami river, a total distance of about five or six miles. The village of Evanston is yet small but rapidly growing and the amount of the sewage will, before a great while, be so considerable that, with the

limited amount of dilution, it may become a serious nuisance to those living near the creek.

I would therefore recommend that the plans be approved only on the condition that the corporation of Evanston, within three years from completion of the proposed sewerage system, shall, if demanded, purify its sewage in a manner satisfactory to the Board.

In this connection, I would call attention to the fact that the village of Norwood is now discharging its sewage into the same stream but a short distance below the corporate limits of Evanston, but when the sewers were built, I am unable to say.

COLUMBUS, OHIO, *April* 2, 1895.

MR. CHARLES A. EWING, *Consulting Engineer, Cincinnati, O.*:

SIR: The State Board of Health has considered your application to approve the proposed outlet of the sewerage system of the village of Evanston. The outlet is hereby approved, provided, that the corporation of Evanston will agree to purify its sewage in a manner satisfactory to the Board, and within three years from the completion of the proposed sewerage system, if then deemed necessary by the Board.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON THE PROPOSED SEWERAGE SYSTEM FOR HAMILTON.

To the Commissioners of Sewers, Hamilton, Ohio:

GENTLEMEN: In accordance with the provisions of Section 2 of an act passed March 14, 1893, the undersigned committee of the State Board of Health, on November 22, 1894, inspected the outlets of your proposed system of sewerage, and the same are hereby approved.

The Board desires to state, however, that it considers there is a probability that sewage from sewer district No. 3, will in time be of sufficient quantity to create a nuisance along the river front. This possibility has happily been anticipated by your commission, and the grades in this district will permit of the extension of the outlet sewer so as to form a junction with the combined outlet sewers for districts 1 and 2, should this become necessary.

The Board is greatly pleased to note that the whole system has been arranged with the view of ultimately purifying the sewage before turning it into the river. But for this commendable foresight on the part of your commission it would be necessary for the Board to withhold its approval.

Your attention is respectfully called to the necessity for regulating connections with the public sewers, and the construction of house drains and plumbing. Unless such work is done in a safe manner, sewers may become an actual menace to the public health. It is recommended that your commission formulate an ordinance to be presented to council for adoption, which shall designate how all such work shall be done, and provide for an inspector to see that the ordinance is properly enforced.

The thanks of the committee are due, and are hereby tendered to the members of

your commission for the courtesies which enabled it to perform its work to the best possible advantage.

Respectfully submitted,

(Signed) BYRON STANTON, M. D.,
THOS. C. HOOVER, M. D.,
C. O. PROBST, M. D.,
Committee.

REPORT ON THE PROPOSED SEWERAGE SYSTEM FOR MARYSVILLE.

BY E. T. NELSON, PH. D.

To the State Board of Health:

GENTLEMEN: I beg to make the following report of the examination of the proposed sewerage system for the town of Marysville, Union county, Ohio.

Acting under appointment of Dr. Byron Stanton, President of the Board, on Saturday, July 27, 1895, I examined most carefully the plans of the system of sewers, prepared by Frank Snyder, Esq., an engineer well known to the members of the Board, and also visited every point in the district to be sewered. In the investigation, I had the assistance of his honor, the mayor, of the clerk, Mr. Jesse F. Pease, and of the following members of the town council: A. E. Plate, Dr. W. F. White and W. S. Smith.

The proposed sewer will start on Main street near the line of the C., C., C. & St. L. Railway at the extreme southwest side of the town. The line extends principally on Main, Sixth and Plum streets to Mill creek on the northeast side of the town, just beyond the tracks of the T. & O. C. Railway. This course is taken for the double purpose of avoiding grades and accomodating the probable future growth of Marysville.

The plans contemplate the "separate system," and the pipes vary from six inches (for a very short distance) to fifteen inches at the outlet. Arrangements have been made for flushing at fourteen different points, and for examination at thirty man-holes. The system does not present any difficulties whatever and is hereby recommended for approval without change.

The only problem presented, and the only question in which the Board is interested, concerns the outlet into Mill creek. At the present time the bed of the stream is almost dry, with little if any current at the point where the outlet is to be had. This may be accounted for in two ways. The rainfall for the present season has been less by more than eight inches than the average. This and other streams in the country

are lower than ever before known. Such a condition is therefore unusual and is not likely to be repeated.

The principal trouble is clearly in sight and may be removed without difficulty. When the T. & O. C. tracks were laid, a portion of the creek bed was appropriated and a new channel cut for the stream. This channel has not been cut to a sufficient depth, neither has it been so cleaned of stones and other obstructions as to allow the water to flow unhindered. These matters could be changed in a few days and at almost no cost.

In the immediate neighborhood of the proposed outlet there is a section of bottom land which might be adopted to sewage farming without much if any change in grades. I had not the time to make such an examination of this situation as to enable me to make any report as to the character of the soil and therefore its fitness for the object named. I am informed that it is the ultimate purpose of the town to carry the sewage across the creek onto some portion of the bottom land, and establish a farm, but that the condition of the treasury will not permit this extension for the present. The town is to be congratulated on its public spirit and its desire to construct a system of sewers that will be modern and sanitary.

I recommend that the system of sewers be approved, but only on the following conditions:

1st. That the bed of the new channel must be so deepened and cleaned as to allow the free flow of water at a l times and all stages.

2d. That the weeds and water grasses must be cut away from the point of the proposed outlet and for all the channel down to the cut already named.

It is most strongly recommended upon the town coun·il that an investigation be instituted as to the best situation for a sewage farm, and that the necessary land be secured at the earliest possible time.

COLUMBUS, OHIO, *October* 9, 1895.

To the Mayor and Council, Marysville, O.:

SIRS: The State Board of Health has considered your application for approval and caused an examination to be made, of the outlet for your proposed sewerage system, to-wit: Into Mill creek on the northeast side of the village, beyond the tracks of the Toledo and Ohio Central Railway, and the same is hereby approved, subject to the following conditions:

1st. That the bed of the new channel be so deepened and cleaned as to allow the free flow of water at all times and all stages.

2d. That the weeds and water grasses be cut away from the point of the proposed outlet, and for all of the channel down to the cut already named.

It is most strongly recommended that an investigation be instituted as to the best situation for a sewage farm, and that the necessary land be secured at the earliest possible time.

Please inform me whether the above conditions are accepted.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON THE PROPOSED EXTENSION OF THE SEWERAGE SYSTEM OF SALEM.

BY JOSIAH HARTZELL, PH. D., AND C. O. PROBST, M. D.

To the State Board of Health:

GENTLEMEN: The above committee was appointed to investigate and report upon the application of Salem to approve of the extension of the sewerage system of that city. We visited Salem July 10, and beg leave to submit the following report:

It should be stated that in 1891 a vote was taken in Salem on the issuing of bonds to construct a complete sewerage system for the city. The secretary was called to Salem before the vote was taken to inspect the plans. A brief description of the plans for sewerage proposed at that time may be found on page thirty of the annual report of the State Board of Health for the year 1891. The proposition to issue bonds was overwhelmingly defeated. Subsequently storm water sewers about a mile in length were constructed in the district most needing sewerage. Although constructed for storm water purposes a considerable number of house connections have been made.

This sewer discharges into a county ditch, practically within the city.

In October, 1893, the secretary was called to Salem by the residents of Perry township, adjoining Salem, to investigate a nuisance caused by pollution of this county ditch by sewage from Salem. A report on this nuisance will be found on page ninety-eight of the annual report of the State Board of Health for the year 1893. It will be seen by this report that a nuisance has already arisen from discharging sewage into this county ditch.

The plans which the Board is now called upon to approve provide for the extension of the present storm water sewers, with the distinct understanding that house connections will be allowed—in fact, a combined system of sewerage. The present outlet into the county ditch is to be used for the extended system, which, altogether, will perhaps provide sewerage for the greater part of Salem.

At or near the point where the sewage is to be discharged the site appears favorable for purification works, but the topography of Salem is such, we are informed by the city engineer, that it is practically impossible to bring the sewage from a large part of the city, now unsewered to this point. If it is required to purify all the sewage of Salem, and this will undoubtedly eventually be necessary, there would have to be two

sewage disposal plants if the present plans are carried out. It is possible, however, to carry all of the sewage by gravity to the northwest, as was originally proposed by the city engineer, and the conditions for purifying the sewage are much more favorable in this direction.

Two plans suggest themselves to the committee for improving the sewerage of Salem.

First, to construct a complete system of small sewers for house drainage only, with outlet to the northwest, as proposed by the city engineer in 1891. The engineer is of the opinion that this plan would be defeated again by popular vote, on account of the expense.

Second, to construct a sewer that would carry the dry weather flow—house drainage—of the present system to the northwest outlet, allowing a storm water overflow into the county ditch. The engineer informs us that it is entirely practicable to construct a sewer, which need not be more than eighteen inches in diameter, beginning near the present outlet of the storm water sewer, and extending to a favorable outlet to the northwest, which will permit of all the sewage of Salem being delivered to this point by gravity. This plan would allow the sewers already built to be still used for house drainage, would permit the extension of the storm water sewers, as now proposed, and provide a favorable location for sewage disposal works, which must ultimately be constructed.

Your committee would therefore recommend if the properly constituted authorities of Salem will agree that within the space of two years all the constant or dry weather flow of sewage shall be delivered at a safe and proper outlet, and shall be purified in a manner satisfactory to the Ohio State Board of Health, that the sewerage plan which was submitted to the representatives of the Board on July 10, be approved; otherwise disapproved.

It should be stated that the city solicitor of Salem has raised the point that as no change in outlet is contemplated in extending their sewerage system it is questionable whether this is a case in which the Board would have jurisdiction. He is not inclined to press this point.

There is urgent demand for sewerage facilities, and they desire to commence work at once.

REPORT ON SEWERAGE FOR TIPPECANOE.

BY BYRON STANTON, M. D.

To the State Board of Health:

GENTLEMEN: The village of Tippecanoe, Miami county, having made application for approval of a plan of sewers to discharge into the

Miami and Erie canal, to be used for the present for storm water and cellar drainage only, but on completion of water works, which are now under contemplation, to be used for all sanitary purposes, I went to said village on January 30, 1895, to make an investigation of the proposed plans.

Tippecanoe is a village of about 1,500 inhabitants, on the west side of the Miami and Erie canal, and so situated that the surface drainage is into the canal. To the east of the canal is the Miami river. To extend the sewer to the river would necessitate tunnelling under the canal and extending the sewer about 800 feet, at an expense which some of the citizens feel they could not bear.

So long as the sewer is used only for storm water and cellar drainage, I can see no objection to discharging into the canal, but such disposal of sewage from house connections would undoubtedly create a nuisance. I would therefore recommend that the proposed discharge of sewage into the canal be not approved except on condition that the council of Tippecanoe shall pass and rigidly enforce an ordinance prohibiting the use of the sewer for any house, water closet or vault connections, and if any such connections are made the sewer shall be extended to the river, and provided further that the village authorities shall secure the permission of the Board of Public Works to discharge the sewage into the canal.

COLUMBUS, OHIO, *April* 3, 1895.

Mr. ELLIS H. KERR, *Mayor, Tippecanoe City, Ohio:*

SIR: The State Board of Health has considered your application to approve the outlet of the proposed system of sewerage for your village.

The same is hereby approved, provided, first, that the council of the village of Tippecanoe City shall pass and rigidly enforce an ordinance prohibiting the use of the sewer for any house, water closet or vault connections, unless the sewer shall first be extended to the river, and second, that permission to discharge sewage into the canal shall be secured from the State Board of Public Works.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON ADDITIONAL SEWERAGE FOR WARREN.

EDWARD T. NELSON, PH. D.

To the State Board of Health:

GENTLEMEN: At the request of Secretary Probst, on the authority of the president, and in answer to a call from Hon. F. S. Chryst, City Solicitor of Warren, Ohio, I went to Warren on Friday and Saturday, October 18 and 19, 1895. Calling at the office of H. C. White, the City Engineer, I saw the plans of the proposed sewer improvements. I also

had the pleasure of meeting Hon. C. C. Bubb, President of the council, and later, his honor, the Mayor, Mr. Predmore. Mr. F. S. Chryst came in a little afterwards. The object of my visit was to pass on a proposed addition to the sewer, already approved as a whole by a former committee of this Board, consisting of Secretary Probst, Mr. Hartzell and myself.

The plans have not been changed since my last visit in any essential matter. The part ready for construction begins on South street (not west Market street) at the corner of Parkman road. It runs east on South street to Highland avenue, a distance of perhaps 1,600 feet. It then turns south on Highland avenue another 1,600 feet and enters the river by what is known as "Foster's Gulch," the name by which this sewer will be known in the city. It is also proposed to build an extension west from Highland to Union, and on Union to Tod, then two laterals, one north and the other south. The former will be perhaps 500 feet in length and the other perhaps 800. The plan also contemplates building the north extension of Tod still further north until it meets west Prospect street.

The sewers will be constructed of tile and the engineering portion of the work does not present any difficulties unless they should strike stone, which is quite possible.

As already noticed this Board approved a sewer in this same western part of the city, known now as the "First Street Sewer." This has been built according to plans then shown us. It starts at the intersection of Tod avenue and Oak street and runs east to Highland and then to the river. The members of the Board will remember the low tract of land east of the river and south of the city. It is the place to which all the sewage of Warren could be brought for final disposal Mr. White, the engineer, has had this possibility in mind with all his plans, and is giving to each one such position and slope as will enable him to make the connection, should the city be able to pay for the work. Both Mr. Bubb and the mayor gave me to understand that this was their plan and that they were working to it as rapidly as possible.

On West Prospect street there is a sewer constructed by Mr. George P. Hunter, in 1892, to drain some land belonging to him which he wished to place on the market. This sewer runs east and empties directly into the river some distance above the dam at west Market street. Sooner or later that sewer district must be brought into connection with the Foster's Gulch sewer. That is the object of the proposed extension of the lateral on Tod avenue, north for 1,200 feet. Mr. Hunter, who very kindly went with us over a portion of the district and then called at the hotel for conference, thinks that some such connection must be made in time, but does

not think that the west Prospect sewer is at present doing any special damage. I understand that he is getting out an injunction against the lateral already described as extending to west Prospect street.

The dam across the river at Market street gives to the city a frontage of dead water in the form of a semi-circle. During the past winter the dam was carried away by a flood and the bed of the river washed as clean as a floor, which was possible because the bed of the river is stone. Mr. Perkins, one of the public spirited people of Warren, owns fifty acres of land in the bend of the river, and as I understand, has considered the plan of increasing the depth of the water so as to give a constant depth over all this flat land. Then it has been proposed to purchase the dam and remove it, the new dam being built north of Market street with the object of placing the outlet of the Market street sewer below the dam and not above it as it is today. If this is not done at once, a plan to change the outlet of Market street sewer will be presented to council for passage. The outlet will be raised or closed for the lower eighteen inches. This will be sufficient to carry the current backward to Market alley, from which point a new sewer will be built south on Franklin to Park and then south to the river. The old Market sewer outlet, now twenty-seven by thirty-seven inches, will be left with ample size for a storm water outlet. Speaking of that suggests a question of the proper size of the sewers for such a town. This sewer is twenty-seven by thirty-seven inches, egg shaped, with the small end down. The average flow from sewage alone is less than six inches. After a rain which was called "a smart summer shower," the flow increased to nine inches.

As an object lesson I may call your attention to the fact that while on my rounds during this visit to Warren, a boy was fishing off the bridge on Market street just in front of the opening of the sewer. While I was standing there he caught the third fish for a mess which he wished to take home.

Returning to the special subject of this report, I ask the Board to approve the present proprosed addition to a system constructed under our authority. I am sure that no other place in Ohio is giving more study to the subject of good sewerage than Warren, and that a perfect solution of the matter will be developed just as the means will allow.

COLUMBUS, OHIO, *November* 5, 1895.

MR. F. S. CHAYST, *City Solicitor, Warren, Ohio:*

DEAR SIR: The State Board of Health has considered the application of the city of Warren to approve plans for additional sewerage.

At a meeting of the Board held October 31, 1895, it was voted to approve the plans for proposed additional sewerage, provided sewage purification works, satisfactory to the Board shall be built within two years from the date of the first use of the new sewers,

and provided, further, that all sewage from Warren shall be by that time satisfactorily purified before discharging it into the Mahoning river.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON PROPOSED EXTENSION OF SEWER AT WYOMING.

BY BYRON STANTON, M. D.

To the State Board of Health, Columbus, Ohio:

GENTLEMEN: The village of Wyoming having applied to the State Board of Health for approval of a proposed change of outlet for a sewer known as the Mt. Pleasant Avenue sewer, I inspected the location and plans on the 8th of August, and would report that the contemplated change is simply the extension of the sewer about 300 feet through a natural waterway, which is much of the year dry, on the property of C. S. Woodruff, P. Reddinger and others. The discharge will be into the same water-course—a branch of Congress run, a tributary to Mill creek. The sewer is used principally as a storm water sewer, though a few house connections have been made with it.

As the character of the sewage will not be changed by the extension, I would recommend that permission be granted to make the proposed change, provided, however, that this permit shall not be regarded as authorizing the use of the sewer for water closet connections.

COLUMBUS, OHIO, *August* 15, 1895.

MR. E. F. LAYMAN, *Village Engineer, 64 West Third Street, Cincinnati, O.:*

DEAR SIR: The State Board of Health has caused an examination to be made of the proposed extension of the Mt. Pleasant Avenue sewer in Wyoming, and I hereby notify you that the extension has been approved by the Board.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON THE PROPOSED SEWAGE DISPOSAL WORKS AT ALLIANCE.

BY C. O. PROBST, M. D. SECRETARY.

Plans for sewage disposal for Alliance by intermittent filtration were submitted to the Board, March 4, 1895, but owing to difficulties met with in securing the only land suitable for the purpose, the plans have been

changed, and the Board is now called upon to approve of sewage disposal by chemical precipitation.

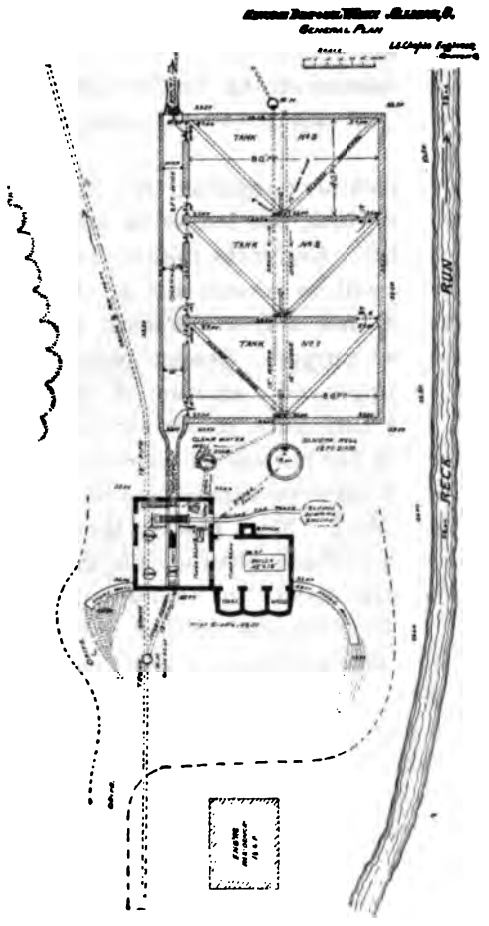
The works are to be located on the Garrison and Reck property, north of Keystone street and just east of and adjoining the present outlet of the main sewer.

There is to be a machinery building, 30 x 32 feet, composed of an engine, mixing and press room, two stories in height; also boiler room, 20 x 32 feet, one story high. Under the floor of the engine room, an inlet chamber three feet wide will be constructed, at the upper end of which the sewage is discharged into it from the main sewer, by means of an inlet sewer built for that purpose. Sewage passing through this inlet channel receives at its upper end a solution of lime then passing down along the channel, goes through a screen composed of flat iron bars spaced one inch apart, for the purpose of intercepting stringy and other foreign matters. Beyond this screen the sewage receives a charge of alum, and is carried to tank No. 1. After passing through tanks 1, 2 and 3, the sewage passes down an effluent channel into the old bed of Reck run.

Any one of these tanks may be cut off from the others for the purpose of cleaning it. In cleaning, the clarified sewage is drawn off from the surface by means of floating skimmer pipes into a 12-inch iron clear water drain laid underneath the bottom of the tanks. This drain is laid on a perfectly level grade, having two outlets, one on the river side through which clear water will be discharged into the Mahoning river at all times, except when the water in the river is above the flow line of the pipe. At these times the clarified sewage will still be discharged into the river until it reaches the level of the river. At that time the valve on the clear water drain at the northerly end of the tank will be closed and the valve in the clear water well near the building opened, and the remaining clarified sewage will be emptied into this clear water well and from there lifted by means of a centrifugal pump to such an elevation as will enable it to flow into the new channel of Reck run.

After the clarified sewage is drawn from a tank the sludge remaining is carried by an under drain to the sludge well, and the sides and bottom of the tank then washed with a strong solution of lime water. Sludge will be pumped from the sludge well to the filter press beneath which a sludge car will pass to receive the sludge cakes and carry them to dumping grounds, where they will be deposited until hauled away by farmers. Arrangements are made whereby instead of pressing the sludge it can be pumped onto high grounds adjoining the works and utilized as a fertilizer.

The city of Alliance, by popular vote, has decided to issue bonds for $20 0 0 to build these works. The State Board of Health is asked to approve these plans.



DESCRIPTION OF SEWAGE PURIFICATION WORKS FOR ALLIANCE.

BY L. E. CHAPIN, CONSULTING ENGINEER.

GENTLEMEN: I herewith present the following report and description of the method of purification designed by me for the purification of the house sewage in the city of Alliance.

The method of purification will be that known as "Chemical Precipitation," and which, in brief, consists in adding chemical re-agents to the crude sewage, which by reason of their action upon the sewage combine with the organic matter both in suspension and solution forming a precipitant by reason of which a larger portion of the organic matter is

deposited in the bottom of the settling basins; and the chemicals designed to be used are common lime and sulphate of alumina—although the design of the works is such that any of the other re-agents in common use for the treatment of sewage can be utilized by means of the same fixtures.

LOCATION OF WORKS.

The works are designed to be located on the Garrison & Reck property north of Keystone street and just east and adjoining the present main sewer, as shown on location plan herewith submitted.

(The works designed contemplate a machinery building composed of an engine, mixing and press-room 30 x 32 feet), and being two stories in height, the second story being utilized as a chemical storage room and for the slaking and mixing of the chemicals; (also a boiler room 20 x 32 feet) in plan, and one story in height. On the upper side of the building it is proposed to construct an elevated driveway in order that the chemicals can be delivered on the second floor of the main building without the expense of elevating apparatus; and under this driveway to the back of the boiler room will be located three arched coal vaults having a capacity sufficient to hold thirty tons of coal.

The lower floor of the engine room will be of concrete, the upper floor of two thicknesses of Norway pine. Boiler room floor to be of hard burned vitrified brick on edge. The stack to be an ornamental brick stack sixty-five feet in height.

Under the floor of the engine room an inlet channel three feet wide will be constructed, at the upper end of which the sewage is discharged from the main sewer by means of an inlet sewer built for that purpose. The sewage passing through this inlet channel receives at its upper end a solution of lime water, which falls into the sewage from the serrated edges of a cast iron tray; then passing down along the channel goes through a screen composed of flat iron bars spaced one inch apart for the purpose of intercepting stringy and other foreign matters which would have a tendency to choke the machinery. Beyond this screen and near the northerly side of the building is a second tray having serrated edges from which the alum water is fed into the sewage. Leaving the building this inlet channel continues down to the head of tank No. 1; there being placed in this inlet channel from the building to tank No. 1, a series of deflecting boards for the purpose of thoroughly agitating the crude sewage, the lime and alum for the purpose of obtaining the complete mixture of these chemicals with the sewage before the sewage reaches the precipitation tanks.

At the upper end of tank No. 1, this inlet channel widens out into a circulating channel eight feet in width. The object of this circulating

channel is to form a ready means of guiding the sewage into and out of the tanks, which is attained by means of flash board gates built into the ends of the tanks and across the circulating channel.

The sewage entering tank No. 1, the gates being in proper position, travels directly across the tank to the easterly side, and there striking the easterly side of the tank is deflected back and passes out through the flash board gate into the circulating channel again; thence into and out of tank No. 2, and tank No. 3, leaving tank No. 3, passes down an effluent channel into the old bed of Reck run.

During the passage of the sewage through these tanks, by reason of the action of the chemicals the organic matter in the sewage is deposited in the bottom of the tanks in the form of a thick dark material called sludge.

When necessary to clean one of these tanks, the flash board gates allowing the admission and exit of the sewage from this tank are closed and the gate in the circulating channel opened, which allows the sewage to pass by this tank into the next tank. After the sewage water has been allowed to stand some three or four hours in the tank so cut off, the condition of absolute rest of this liquid results in the organic matter settling to the bottom leaving the clarified sewage on the surface. This clarified sewage is then drawn off from the surface by means of floating skimmer pipes into a 12-inch cast iron clear water drain laid underneath the bottom of the tanks. This clear water drain is laid on a perfectly level grade, having two outlets, one on the river side through which clear water will be discharged into the Mahoning river at all times except when the water in the river is above the flow line of the pipe. At these times the clarified sewage will still be discharged into the river until it reaches the level of the river; at that time the valve on the clear water drain at the northerly end of the tank will be closed and the valve in the clear water well near the building opened, and the remaining clarified sewage will be emptied into this clear water well and from there lifted by means of a centrifugal pump to such an elevation as will enable it to flow into the new channel of Reck run.

After the clarified sewage is drawn down to the level of the sludge the floating skimmer pipe is raised and the 12-inch compression gate valve communicating from the bottom of the tank with the 15-inch sludge drain, also laid under the bottom of the tanks, will be opened, allowing the sludge to flow into the sludge well located between the building and the tanks. This sludge well being twelve feet in diameter serves as a storage basin for the accumulated sludge, from which it will be drawn for the purpose of pressing or pumping it onto the adjacent lands. After the sludge has been thoroughly cleaned from off the bottom

of the tank, the sides and bottom will then be washed by a strong solution of lime, which will not only cleanse the walls but thoroughly sterilize any organic matter adhering to the inside of the tank; after which the sludge valve will be closed and the flash-board gates opened allowing this tank to be refilled.

In the treatment of the sludge, it is proposed to erect a sludge forcing pump in the engine room. This sludge forcing pump will have a suction pipe communicating with the sludge storage well, and also a suction pipe connecting with the clear water well. This sludge forcing pump taking the sludge from the sludge storage well, will pump it into the chambers of the filter press, where the solid matters contained in the sludge will be filtered by means of canvas sacks and retained within the press, and the exuded water in the filtering process falling down under the press into a trough shaped channel discharging into the inlet channel which passes directly beneath the press. After the press has been filled and further filtration impracticable, a sludge car will be run underneath the press, the press opened and the sludge cake so made dumped into the car; the car may then be run to either side of the building to the dumping grounds provided for the disposal of the sludge cake. This sludge cake may be used as a fertilizer, and hauled away by farmers, or it may be allowed to dry and then be reloaded into the sludge car and burned in the boiler furnace.

Arrangements are also made whereby this sludge instead of pressing it, can be pumped and delivered onto the high grounds adjoining the works on the east, and utilized as a fertilizer, without passing it through the filter press. The clear water suction leading to the sludge forcing pump will be utilized to free the pump of thick matter at the close of the operation of pumping the sludge for the purpose of freeing the pump passages of all foreign matters, and leaving the pump in a fit condition to be again promptly started when needed.

In the boiler room will be located a 48-inch by 12-foot tubular boiler for the purpose of generating steam for propelling the necessary machinery and to heat the building in the winter. This boiler will be fed by a three-quarters inch injector, and also by a boiler feed pump. The boiler feed pump being also used for the purpose of filling an overhead tank located above the trusses of the chemical storage room, and also to pump the strong solution of lime water needed for the purpose of washing the precipitation tanks after cleaning.

On the floor of the chemical storage room will be placed a lime slaking tank of wood, into which the lime will be placed and sufficient water added from the overhead tank to thoroughly slake the lime. From this slaking tank, the lime water solution so obtained will be fed into the

lime water mixer located on the floor of the engine and press room. This lime water mixer will be circular in form, five feet in diameter and six feet in height, and to prevent sedimentation of the lime, the lime water contained in this mixer will be agitated by means of revolving beater arms.

There will also be located on the floor of the engine and press room a second chemical mixer for the purpose of mixing the sulphate of alumina with water for the purpose of obtaining the alum solution before adding the same to the crude sewage. The power to operate these two mixers will be obtained by a vertical steam engine of approximately twelve horse power. This engine will be located and set on a bed plate of stone six inches in thickness, and located directly over the inlet channel, the exhaust and drip water from the engine being carried down directly underneath and into the inlet channel. Power will be had also from this engine for the purpose of operating the centrifugal pump located in the clear water well for the purpose of removing the clarified sewage water from this well at such times when the level of the water in in the river will prevent its being discharged by gravity into the river.

The approximate cost of the plant in complete running order is as follows:

Grading and masonry for tanks	$8,000 00
Sludge, clear water and manhole wells	1,000 00
Building and stack	3,600 00
Machinery and boilers	4,000 00
Valves, gates and all metal work	800 00
Engineering, inspecting and printing	1,000 00
Total	$18,400 00

It is believed that the works can be built for the above estimate, and that in case desirable bids should exceed the above $18,400, the brick stack for the pumping station can be dispensed with, thereby reducing the cost.

The necessary time to complete the plant from the time construction commences will be approximately three months. The works have been designed with the idea of concentrating the machinery and systematizing the operations so that one man can take care of the plant until such time as the increased quantity of sewage would necessitate extra labor for night attendance.

COLUMBUS, OHIO, *August* 15, 1895.

MR. L E. CHAPIN, *Consulting Engineer, Canton, Ohio:*

DEAR SIR: The State Board of Health has examined the plans proposed for purification of sewage at Alliance, as submitted by you, and I hereby notify you that the plans have been approved by the Board.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON THE PROPOSED SEWAGE DISPOSAL WORKS AT FOSTORIA.

BY C. O. PROBST, M. D., AND JOSIAH HARTZELL, PH. D.

The above committee, on August 6, visited Fostoria to inspect plans and grounds proposed for sewage disposal. This report is accompanied by a report of the engineer which gives a detailed description of the proposed works. Following the submittal of this report the engineer, a committee of council and the city solicitor of Fostoria, visited a number of sewage disposal works in New England, and also the plants at Oberlin and Canton, Ohio. The recommendations of the engineer, as given in the accompanying report, were approved and adopted by council, and a vote will be taken August 20, on issuing bonds for $30,000 to build the disposal works and crematory, and to purchase necessary land.

The land selected is a loamy clay, and it is believed to be sufficiently porous for filtration purposes. There are no houses in the immediate neighborhood, although a public highway, the Perrysburg road passes by the grounds. Your committee carefully examined the plans in all their details, and then inspected the grounds for the proposed works, and recommends that the plans be approved.

We desire to specially commend the plan for providing a crematory for the destruction of sludge, night soil and garbage, as a new feature of disposal works. Even should it be found impracticable to burn all the sludge the advantages of having a crematory for garbage and night soil in connection with the disposal works will fully repay for its construction.

Drawings showing the various parts of the disposal works and crematory will be filed with the Board by the engineer.

ENGINEER'S REPORT.

Fostoria has a system of sewers consisting of about twenty-three miles, with a possibility of extensions of the system by adding about twelve miles more to the districts now sewered as the growth of the city demands such extensions. About ten miles of this system, constituting districts Nos. 2 and 4, discharge the dry weather flow and light rains into an 18-inch pipe sewer, which carries the sewage to a point on the Portage creek just west of the Perrysburg road and one-half mile north of the corporation line. These districts discharge storm water through relief outlets directly into Portage creek within the city limits. Sewer district No. 1, consisting of about twelve miles of sewers, discharges the whole flow at the same point on Portage creek as the dry weather flow of districts Nos. 2 and 4.

In view of the probable necessity for artificial disposal of the sewage these sewers were brought together as stated and a dry weather flow drop and gate chamber constructed in the main outlet of district No. 1.

The peculiar topographical conditions confronting the engineer in this city precluded the adoption of any other than a combined system without the expenditure of an unreasonable amount of money.

With a combined system to deal with, the question of sewage disposal becomes more complicated than with separate sanitary sewers where the daily flow is nearly regular and not increased by rains except by the infiltration of ground water. Still the question, although complicated, can be met and dealt with in a satisfactory manner.

Another point that will of necessity make any form of artificial disposal an expensive one in Fostoria is the fact that, owing to the slight difference in level between a large portion of the city and high or even low water in the creek, the dry weather sewage, together with a small proportion of storm water, will have to be lifted by pumps. This will be the case under any form of disposal that may be adopted.

In view of this fact, and for other reasons based upon the facts regarding different forms of disposal outlined in this report, I would recommend the system of intermittent downward filtration on specially prepared and underdrained beds. Accordingly I herewith submit plans for a system based upon the principles of this method, together with an estimate of the cost of construction and operation.

The plan comprises, briefly, a gate chamber provided with screens for separating the paper and other floating matter liable to clog the pump valves. Into this chamber is conducted the dry weather flow sewers of districts Nos. 1, 2 and 4. After passing through the gate chamber and screens the sewage is conducted into two parallel tanks excavated in the rock and lined with concrete and covered with arches of brick masonry. These tanks, which serve both as settling tanks and as reservoirs to obviate continuous night and day pumping, are each 29½ feet wide by 100 feet in length in the clear, and have an average depth of 8.62 feet, and will contain, when full, 188,593 gallons each, or together, 377,186 gallons of sewage. When in continuous operation as settling tanks the sewage will flow slowly through the tank in a broad sheet, depositing the greater portion of matters held in suspension by sedimentation. After passing through the tanks the sewage will flow in a thin sheet over a weir, and falling into a channel prepared for the purpose, will flow by gravity into the pump well, from whence it will be lifted by the pump and forced through a cast iron force main to a point in the land reserved for filtration, where it will be conducted through vitrified pipe channels to the several filter beds. In the center of each tank is a sludge drain running lengthwise with the tank, and to which the bottom of the tanks slope from the sides. These sludge drains are connected with the sludge well by 15-inch pipe carriers provided with gates; the sludge well is ten feet in diameter and will contain 400 cubic feet to the flow line. When it becomes necessary to draw off the sludge from the bottom of the tank, the tank thus treated will be cut off from the sewer by closing a gate. Then by lowering the skimmer pipe, shown on general plan and section, which works on a movable joint and is attached to a float, the sewage will be drawn off slowly from the top as the float and skimmer pipe descends until the sludge deposited on the bottom of the tank is reached, then the skimmer pipe is raised and by opening the gate on sludge carrier the sludge will descend by gravity into the sludge well. While this process is taking place the regular flow of sewage passes through the other tank, over the weir and into the pump well.

The question of sludge disposal is the next thing to be considered. Sludge may be disposed of in the following ways, all of which have advocates, and some of which are in use:

1. Sludge may be deposited on filter beds, and after draining the greater amount of the water contained, may be removed in carts to be used as a fertilizer or be ploughed under in the beds.

2. Sludge may be compressed by a filter press into solid cakes, in which form it may be handled and conveniently transported for use as a fertilizer.

3. Sludge, either in the liquid state or after partial dissication, may be mixed with combustibles such as peat, tan bark and sawdust, and disposed of by burning.

4. Sludge may be mixed with earth, rubbish, vegetable mould, stable manure, leaves or other suitable material, to form compost heaps, and in this manner finally be utilized as manure.

5. Sludge may be burned in a furnace of form similar to a garbage destructor, or in a garbage crematory in connection with garbage, as at Coney Island, N. Y.

The principal objection to the first of these systems of sludge disposal for the case in hand is that we have no land within a reasonable distance that can be used for this purpose, as the sludge, while draining slowly on the filter beds in the hot sun, will give off strong odors which is not to be endured in close proximity to a public road or dwellings.

The objection to methods Nos. 2 and 3 is the expense entailed and the cost of filter presses and machinery for the first and large amount of labor entailed by the latter process. At Worcester, Mass., methods Nos. 1 and 3 were tried and found unsatisfactory, and the city had to haul large quantities of sludge at their own expense and distribute it on farm lands. At Canton, O., the sludge was treated by method No. 2, but this year it is being pumped onto land in the vicinity of the works and ploughed under.

Method No. 4 looks reasonable and feasible upon first examination, but the labor involved in this process is also great, and it has been found that farmers are slow to realize the value of sludge as a manurial agent and refuse to pay for it, and, in many cases, to even handle it for nothing.

Method No. 5 may now be considered. Taken by itself the disposal of sludge by cremation is probably as expensive as any other form of treatment except methods Nos. 2 and 3, but in the case in hand, by viewing the subject from all sides, it seems the most feasible and least expensive of any.

The question of night soil and garbage disposal will, before many years assume, and has already begun to assume in this city, the character of a problem to be solved as necessary and fully as important as that of sewage disposal.

Under these circumstances the location and construction of a crematory in connection with the sewage purification works will accomplish the following results: It will save the erection of a stack for the pump boilers and serve as a ventilator for the covered reservoirs by using the crematory stack for both purposes. It will save labor, as one man can attend to the furnace under the boilers and the crematory furnace when in use.

The sludge can be burned and finally disposed of in the crematory at stated intervals by mixing with city garbage, being pumped for this purpose directly from the sludge well to the crematory.

The crematory will not need to be constantly in use, either for burning sludge or night soil and garbage.

The only suitable land to be obtained at the necessary elevation for underdraining for filtration areas and within a reasonable distance of the pumping station is that tract of land owned by Mr. August Flechtner, lying immediately west of Portage creek, and in the south-east quarter of section 36 in Perry township, Wood county.

I have caused topographical surveys to be made of 24½ acres, as shown on "Plan for Sewage Purification Sheet 1," off the north end of this tract. Mr. Flechtner has offered this piece for sale at a reasonable figure. Of this 24½ acres I have divided eighteen acres into nineteen filter beds located with reference to the natural contours of the ground, leaving 6½ acres to be treated by broad irrigation occasionally.

These beds are to be surrounded by slight embankments, the earth for which is to be obtained by leveling the beds, and thoroughly underdrained by common tile laid five feet deep and twenty feet apart.

Following the highest contour of the land, the main carrier, constructed of vitrified pipe, receives the sewage from the force main and distributes it by a system of small, square man holes and simple gates to each area for treatment. When the sewage is to be applied to any one bed the gate in the main line is closed just above the point of dis-

tribution and the side outlet opened. The sewage then flows onto the bed and is distributed over the surface by flowing in furrows ploughed at right angles to the main carriers.

After a sufficient dose of sewage is applied to one bed the side outlet is closed and another opened and the sewage diverted onto another bed.

These beds can be seeded down and various crops raised upon them, which, owing to the value of the sewage as a manurial agent, will be found to flourish to such an extent as to aid considerably in reducing the cost of running expenses.

The storm water, with the exceptions of light rains and the first foul wash of all storms, will not be treated by this system and would be impossible to be cared for by any other system on account of financial considerations, the expense of which would be enormous. In times of storms, however, the stream furnishes sufficient water, together with the storm water from the city streets and roofs, to satisfactorily dilute any sewage that may be passing through the sewers at that time.

As the outlet of sewer district No. 1 is submerged below the level of mean low water in the creek about three and one-half feet, it will be necessary to construct a gate in the gate chamber prepared for that purpose. This gate and the one at the end of the dry weather sewer from districts Nos. 2 and 4, already constructed, will have to remain closed as long as the sewage is passing into the settling tanks, and will only be lifted when the rush of storm water comes. In order to exclude street detritus as much as possible from the sewers, and consequently from the settling tanks, I recommend that dirt pans be hung in the manholes and flush tanks in districts Nos. 1 and 4. This has already been done in the case of district No. 2 shortly after construction, and an examination of the pans will reveal their usefulness. I omitted to state that the reservoirs are to be covered on account of their close proximity to the Perrysburg road. As probably the only unpleasant odor proceeding from the works will be from the reservoir and the sludge well, this is an important point and should not be omitted.

The reservoirs are to be ventilated into the stack.

The cost of the system, as outlined above and set forth in the plan, is estimated as follows:

24 5 acres of land at $150 per acre	$3,675 00
Preparation of beds, underdraining, grading, forcemain, main carrier and effluent drain	6,424 56
Reservoir, sludge and pump well, necessary buildings, boiler, pumps, except stack	14,920 00
Total	$25,019 56

Running expenses, if coal is used as a fuel, about $1,843 per year, without taking into account the probable profits to be realized from the sale of produce raised on the filtering area.

In this connection I would recommend the drilling of a well for fuel purposes. It is quite likely that gas or oil will be found in sufficient quantities for fuel to run the works, which, if found, would considerably reduce running expenses.

The cost of a crematory in connection with the works is not included in this estimate, as I have no reliable data as to the probable cost of such works.

For present use beds Nos. 1, 2, 3, 4, 5, 6, 15, 16, 17, 18 and 19, containing a total area of about 10½ acres, would probably suffice, and I recommend that these beds alone be prepared at present. This would reduce the first cost of the works about $2,000, making the total estimated cost $23,019.56.

The other beds shown on plan can be added as required from time to time.

JOHN P. FORCE, *C. E.*

Since the above report of the engineer was made it has been decided to put in filter presses to deal with the sludge. Sludge cakes will be burned if they cannot be disposed of in any other manner.

COLUMBUS, O., *August* 15, 1895.

MR. JOHN P. FORCE, *City Engineer, Fostoria, Ohio:*

DEAR SIR: The State Board of Health has examined the plans proposed for purification of sewage at Fostoria, as submitted by you, and I hereby notify you that the plans have been approved by the Board.

Respectfully,

C. O. PROBST, *Secretary.*

REPORT ON SEWERAGE FOR (LORAIN) SHEFFIELD LAND COMPANY.

COLUMBUS, OHIO, *February* 13, 1895.

To the Managers of the Sheffield Land Co., Lorain, Ohio:

The State Board of Health, in accordance with the provisions of an act passed March 14, 1893, has considered your application in regard to having an outlet for your proposed sewerage system into Black river, and has caused an examination of the proposed outlet to be made.

It is expected, we are informed, that eventually the sewage of not less than from 12,000 to 15,000 people will have to be dealt with. Black river is a stream of considerable depth, but with little or no current, ordinarily, which discharges into Lake Erie not far from the point where water is obtained for the public supply of the village of Lorain. It would, in the opinion of the Board, very greatly increase the danger of polluting this supply to discharge additional sewage into Black river.

The river, near its mouth, passes through a comparatively thickly settled portion of Lorain, and it is the opinion of the Board, aside from any danger to the water supply of Lorain, that so large an amount of sewage as will have to be provided for should not be discharged, without purification, into Black river.

Your application to discharge crude sewage into Black river is therefore denied. It is suggested that the character of the soil adjacent to Black river be determined with reference to its fitness for purifying the sewage by intermittent filtration.

Very respectfully,

C. O. PROBST, *Secretary.*

To the Managers of the Sheffield Land Co.:

This Board is in possession of your letter of February 14, stating that you had received its report, dated on the previous day; also that you wish to open the sewer to Black river at once, and that it will greatly inconvenience you not to be permitted to do so; also that it was not your intention that this outlet should be permanent; that in fact it would be considered only as a temporary arrangement for your present convenience; also that you desired a revision of our report.

In compliance with your request the president of the Ohio State Board of Health requested members Nelson and Hartzell to inform themselves of your situation and report thereon. We find—

First. There are as yet no house connections to your sewer, that the sewer is not completed, and will not be for several months.

Second. Your officers verbally assured us of their willingness to place in effective operation purification works that would be acceptable to this Board after a lapse of eighteen months.

Third. Your situation is admirably adapted to the introduction of sewage purification.

Fourth. The proximity of the intake of water used in Lorain, including the new addition, renders the purification of your sewage effluent an imperative sanitary precaution.

In as much as it is the policy of this Board to exempt corporations and industrial enterprises from embarrassment as much as is possible, with a due regard to public health, and in view of the necessarily small volume of sewage for some months, we recommend that permission be given the Sheffield Land Co. to discharge crude sewage into Black river during one year from the first use of the sewer as a sewer, and no longer. Also,

In as much as the part of the sewer now unfinished must, in some part of its course, sustain an intimate relation to such purification works as will be constructed it is suggested, in an advisory way, that the early procurement and adoption of a plan of disposal that could be approved by the State Board of Health would be a wise precaution.

Kindly make known to this Board your acceptance of the condition above imposed, viz., acceptable treatment and disposal of sewage after one year's use of sewers. Until such written acceptance on your part is received the original order, dated February 13, will remain in force.

JOSIAH HARTZELL,
EDWARD T. NELSON.

COLUMBUS, OHIO, *April* 3, 1895.

MR. J. B. COFFINBERRY, *Treasurer, The Sheffield Land Co., Lorain, O.:*

SIR: The State Board of Health has considered your application to approve the outlet into Black river of your proposed sewerage system, and the outlet is hereby approved, provided it is agreed that within one year from the first use of the sewer as a sewer the sewage shall be purified in a manner satisfactory to this Board.

Until your written acceptance of the condition imposed above is received, the original order, dated February 13, 1895, will remain in force.

Respectfully,

C. O. PROBST, *Secretary.*

LORAIN, OHIO, *April* 5, 1895.

DR. C. O. PROBST, *Secretary, State Board of Health, Columbus, O.:*

DEAR SIR: Your favor of April 3, advising as to the action taken by your Board in reference to our sewage, is at hand.

We are now taken into the corporation of Lorain and I presume the question is one that the village must take in hand in the future.

We are as anxious to adopt some purification system as the State Board is to have it done, and in so far as we, The Sheffield Land Company, have any power in that direction, we accept the condition proposed by your Board.

Thanking you for favors shown us.

Very truly yours,

THE SHEFFIELD LAND COMPANY,
Per J. B. COFFINBERRY, *Treasurer.*

REPORT ON PURIFICATION OF SEWAGE BY CHEMICAL PRECIPITATION AT CANTON.

BY L. E. CHAPIN, ASSOC. M. AM. SOC. C. E., CITY CIVIL ENGINEER.

The city of Canton with a present population of about 35,000 and covering an area of seven square miles is supplied with a dual system of sewerage, comprising a storm water sewer system for the removal of the rainfall and street wash, and the sanitary system for the removal of household, manufacturing and organic wastes. The portion of the city fully sewered by the sanitary system is what is known as Sewer District No. 3, embodying the older settled and more thickly populated portion of the city. This sewer district furnishes sanitary drainage for about 18,000 people, and the sewers of the district include some eighteen miles of sanitary sewers ranging from six inches to twenty inches in diameter. The outfall sewer originally discharged the sewage into the main branch of the Nimishillen creek, at a point about two miles south of the center of the city. Owing to complaints made by the owners of the lands abutting on the Nimishillen creek below the outlet of the sewer, the question of the method of sewage purification was brought to the attention of the city authorities even before the trunk sewer was built, and twenty-eight acres of land was acquired by purchase at the outfall of the sewer for the purpose of providing land for some method of purification.

After a careful study by the city authorities of the various methods of sewage purification then successfully practiced, the sewer commissioners decided to adopt the method of chemical precipitation for the purification of Canton city sewage, locating the works at a point on the sewer farm, so that the sewage could be brought to it by gravity without the necessity of pumping.

The construction of the works was commenced in 1892, and finished and the plant placed in running order May 15, 1893; since which time all the sewage from the sanitary system has passed through the works.

The plant consists of a substantial frame building on a brick foundation; the building being subdivided into a boiler, screen and pump room 28 x 30 feet, having an interior lining of brick as a safe-guard against fire; a chemical mixing and press room 30 x 40 feet; and a chemical store room with space for slaking lime and alum, 30 x 40 feet; and located above the mixing room. Precipitation is attained in four tanks, each 50 x 96 feet in plan.

With the present amount of sewage flowing per day when filled they have an average depth of about 4.9 feet, the sewage being four feet deep in the shallowest portion and about six feet deep in the deepest portion. The capacity of the combined tanks is approximately 700,000 gallons to the present flow line of the tanks.

The precipitated sludge from these tanks is carried by gravity into a sludge storage cistern; and from thence is lifted by a horizontal duplex, Voisard, sludge forcing pump, having steam cylinders seven and one-half inches in diameter, water cylinders five inches in diameter and all 10-inch stroke. The suction pipe connections are so arranged as to take either sludge from the sludge cistern or clear water from the clear water well; and the discharge connections are such that the sludge may be forced into a filter press or through a line of 2½-inch wrought iron pipe outside of the building to the fields of the farm lying west of the building, or to pump clear water from the clear water well to an overhead storage tank containing about 2,200 gallons and located under the roof of the chemical store room.

The boiler feed pump is a duplex 4½ x 3 x 5, so connected that it can be used for boiler feeding, for filling the overhead supply tank, or pumping water for cleansing purposes about the building and for washing down the sides of the tanks, using a strong solution of lime water after the sludge is removed.

The steam plant consists of a horizontal tubular boiler fifty-four inches in diameter and twelve feet long, set up in a substantial brick-setting with full arch front, and connected with a wrought iron smoke stack fifty-three feet high.

The chemical mixers are wood, eliptical in form with diameters of five and nine feet; each mixer being seven feet high. They are operated by an automatic vertical engine.

The filter press is a Bonnot press having fifty-two chambers, each being twenty-nine inches in diameter and equipped with rubber baskets to obviate tearing of the filter cloths. The chambers of this press are extra heavy, resulting in absolute freedom from breakage, notwithstanding a pressure of 150 to 160 pounds is frequently used.

Within the sludge cistern a No. 5 pulsometer pump is connected, which connections are such that the sludge may be pumped by means of this pulsometer and discharged through a line of 2½-inch wrought iron pipe and some 500 feet of rubber hose onto the clay and gravelly soil of the farm. This pump is used solely as an auxiliary pump to care for the sludge at times when the sludge forcing pump may be in need of repairs.

Water for steam and mixing purposes is drawn from the effluent

channel and pumped into the overhead storage tank before described. From this tank all supplies for water for all purposes is drawn on as required.

METHOD OF TREATMENT.

The sewage is diverted from the main sewer into the inlet sewer, which discharges into the inlet and screen channel beneath the floor of the boiler room. The screen chamber is provided with gates and screen of flat bar iron about one inch apart for the removal of matters which would obstruct the machinery. From this it passes through an inlet channel four feet in width to the four precipitating tanks located without the building. The lower end of this inlet channel connects with a double circulating channel located midway between the four precipitating tanks, two of which are placed on each side of the channel.

At the point where the sewage enters the building it receives a charge of milk of lime from the lime mixer, and where it leaves the building a solution of sulphate of alumina is added. The sewage passing down the inlet channel is agitated by the baffle-boards placed within the channel to insure a thorough mixture of the chemicals with the crude sewage before the latter enters the precipitating tanks. The method of continuous circulation is used in passing this sewage through the tanks. Entering the first tank, traveling to the extreme farther end is then deflected back and re-enters the circulating channel, from which it enters the second tank, and thence into the third and fourth tanks to its exit over the aerating steps of the effluent chamber. From the bottom of which it passes into the effluent sewer to the point of outfall in the Nimishillen creek. The chemicals used, lime and sulphate of alumina, are delivered by wagon into the second story of mixing room, and there stored. The proper charges of lime and alum are weighed out at regular intervals into slaking and dissolving tanks located on this floor, and after being slaked and dissolved with a large surplus of water are passed down into the chemical mixers on the first floor; sufficient water is added to both the lime and alum solutions to facilitate their easy and uniform discharge into the crude sewage. The solution while it remains in the mixers is agitated by beater arms attached to the vertical shafts moving at the rate of about twenty revolutions per minute. This speed being found sufficient to maintain a uniform mixture.

To remove the sludge from the bottom of each tank, the tank to be cleansed is cut out of circulation, the sewage passing by it and into the three other tanks in rotation. In the tank so cut off the sewage is allowed to stand for some hours to enable the water to come to a state of absolute rest in order that precipitation may take place before the super-

natent water is drawn off. This is done by means of floating skimmer pipes discharging into a clear water sewer lying beneath the circulating channel with its final discharge under the steps of the effluent chamber and into the effluent sewer. When the supernatent water has been drawn down to the accumulated sludge in the bottom, the skimmer pipe is raised to the surface, then by means of a 12-inch gate the accumulated sludge is drawn off into a sludge drain, and from thence into the sludge storage cistern placed beyond the tanks just outside of the boiler room. From this sludge storage cistern the sludge is lifted by the duplex sludge forcing pump before described and forced into the filter press under pressures from 80 to 150 pounds per square inch. From this press the exuded water passes out through the filter cloths and into a gutter beneath, and thence through a drain into the inlet sewer, where it is again retreated, the solid matters being retained in the press in the form of cakes. When the press is emptied the cakes fall into a car below, which car, when full, is run out of the building on a track across the tanks to the sludge dumping ground.

From the sludge storage cistern, the sludge can also be lifted by means of the pulsometer pump and pumped direct upon the surface of the farm to the west of the tanks.

The amount of chemicals used depends upon the flow of water in the stream, it being the object of the authorities to discharge such an effluent into the stream that will be no worse than the waters of the stream. During wet seasons the flow of the Nimishillen creek frequently reaches the daily volume of 100,000,000 gallons. Again, during dry seasons the flow of the stream sometimes falls as low as 3,000,000 gallons per day. During flood flows only sufficient chemicals are used to precipitate the large part of the suspended matter in the sewage, whereas during the dry season chemicals to the amount of 300 pounds of sulphate of alumina and 1,800 pounds of lime are used for each day's flow of sewage. The daily flow being approximately 1,350,000 gallons. This amount of chemicals is such as will result in an effluent of apparently clear water and which satisfies in every respect the demands of the property owners along the creek into which the effluent is discharged.

The works have been in operation now for nearly three years and no complaints of any kind have ever been made either from the quality of the effluent or from any odors emanating from the works, although a large number of residences are located in the immediate proximity of the plant.

The total cost of the plant complete including all construction expenses to January 1, 1896, is $31,450.00, which includes the first cost of the land. The annual expense in maintaining the plant for the past

year will be approximately $3,600.00; most of which is for attendance, chemicals and fuel; the expenditures for repairs not exceeding $75.00 per annum.

Although it is not contended that the effluent from these works will compare with the effluent obtained from a well designed and well built intermittent filtration plant, yet the experience of the past three years has shown that chemical precipitation as operated in Canton, presents marked advantages from the entire absence of odors, and the plant is so arranged that in the future should the waters of the Nimishillen creek be used for a public water supply that the effluent from these works can be readily discharged over a small area of carefully prepared filtration beds and further purified before discharging into the stream. And having removed practically all of the suspended matter in the sewage by the method of precipitation the effluent can be readily treated by intermittent filtration and good results obtained by applying a comparatively large quantity of effluent per acre of filtration area.

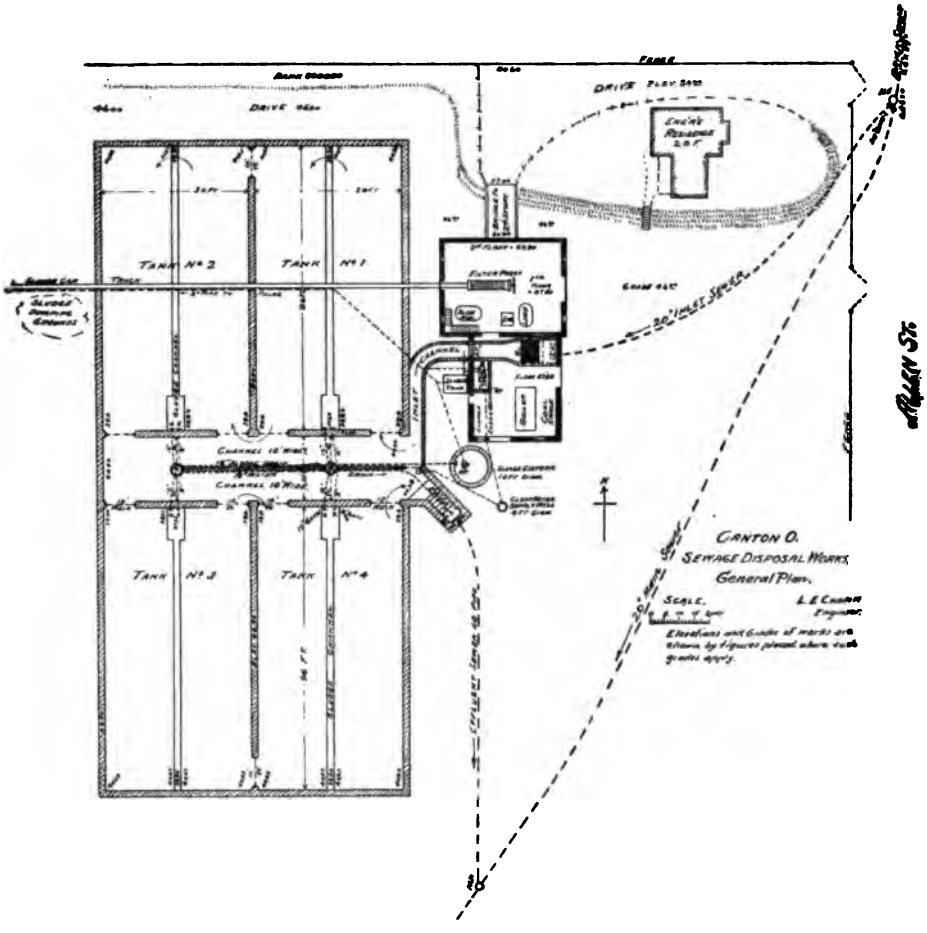
Chemical analyses made of the sewage and effluent by Prof. C. C. Howard, Chemist to the Ohio State Board of Health, are herein shown. The reduction of solids as shown by these analyses does not represent the total amount of purification attained, since over sixty pounds of dry suspended matter are removed from the screens per day, which matters do not appear in the analyses; and further in taking the sampling of sewage all floating fetal matters are rejected so far as is possible.

The water supply used for the city of Canton contains by analyses approximately thirty-two parts of solid matters per 100,000, which solids should be taken into consideration in comparing the total reduction of solids as obtained by the method of precipitation.

So far as appearance of effluent is concerned, very creditable results may be had by the use of 800 pounds of lime and 100 pounds of alum per 1,000,000 gallons of sewage treated.

In localities where suitable sand is not available at low price for the construction of intermittent filtration areas, there is no question in the minds of the people of Canton but that the most satisfactory purification of sewage, taking both the effluent and freedom from odors into consideration is that of chemical precipitation, although the annual cost of maintenance exceeds that of a filtration area, yet the absolute freedom of the works from odors places the corporation in a position to be entirely safe from any complaints, which might result in perplexing damage claims by reason of odors from filtration areas. And in the majority of Ohio cities it would seem that a combination of the method of chemical precipitation with some method of land treatment could be used to good advantage by reducing the annual cost of maintenance and increasing

the purity of the effluent, since it is the suspended matters in the sewage which are so difficult to handle on filtration areas.



DR. C. O. PROBST, *Secretary State Board of Health:*

DEAR SIR: The samples of sewage and effluent received from Canton, January 20, have been examined by myself with the following result, No. 1, twenty-four samples sewage, January 14 to 18. Dose of lime, twenty-four hours, 1,500 pounds. Aluminum sulphate, 300 pounds. No. 2, twenty-four samples effluent, January 14 to 18.

Parts per 100,000.

	Number 1.	Number 2.
Turbidity	very slight	none
Sediment	considerable.	slight.
Color	.3	.0
Oxygen required	1.664	.688
Free ammonia	.894	.676

	Number 1.	Number 2.
Albuminoid ammonia	.326	.112
Nitrogen as nitrites	.0000	.0060
Nitrogen as nitrates	.0090	.1441
Chlorine	2.14	2.05
Total solids	49.3	41.0

A comparison of these results with those reported November 6, shows the reduction of the free ammonia to be 24.4 per cent. instead of 13.4 per cent., while the reduction of the albuminoid ammonia is 65.6 per cent. as compared with 60.6 per cent. The reduction in total solids, however, is only 16.8 per cent. compared with 19.1 per cent. Whether this is due to the larger dose of lime and aluminum sulphate is not determined by these figures. A striking difference is found in the great increase in the nitrogen as nitrites and as nitrates in the effluent over that in the sewage. This would hardly be expected at the lower temperature prevailing at the time of these collections and an explanation of this is not at hand.

Yours truly,

CURTIS C. HOWARD.

NUISANCES.

INVESTIGATION OF THE POLLUTION OF THE SANDUSKY RIVER AT BUCYRUS.

BY C. O. PROBST, M. D., SECRETARY.

To the Board of Health, Bucyrus, Ohio:

GENTLEMEN: Having been requested by your board to make an inspection of the Sandusky river at Bucyrus, with respect to its pollution and a remedy therefor, I beg leave to submit the following report:

On August 22, in company with your health officer, Dr. W. A. Daugherty, I examined the river from above the water works dam to a point just above the cemetery. Along this line of the river seven or eight sewers discharge their filth. The river on account of such pollution was in an exceedingly filthy condition, worse at some places than others. Just above the first bridge below the brewery the pollution was especially marked. The water was inky black, and the odor was foul and nauseating. Several dwelling houses are located near this point.

Very little water was flowing in the river, and its bed in many places was almost entirely uncovered, except with filth. It was the general opinion, however, of all those interested in the subject, that the river was flowing less in the summer of 1894, and that the nuisance was correspondingly greater. Gaugings taken by Mr. H. L. Weber, C. E., July 26, 27 and 28, 1894, showed an average flow of 388.800 gallons in twenty-four hours.

It is plainly evident that the Sandusky river does not afford sufficient water to dispose of the sewage of Bucyrus without creating a nuisance. It is roughly estimated that there must be from twenty-five to forty gallons of pure water to one gallon of sewage, in flowing streams, to prevent putrefactive decomposition of the organic matters in the sewage, and a consequent nuisance. In many places in the river at Bucyrus, where the flow is sluggish, there is probably as much sewage as water in the stream.

The nuisance of which complaint is justly made, must unavoidably grow worse from year to year, unless changes are made, as the amount of sewage will increase, and the dry weather flow of the river is liable to decrease.

The nuisance, so far as the citizens of Bucyrus are concerned, can only be abated by arranging to carry all the sewage to the river at some

point below the city; that is, unless the sewers are abandoned for all purposes except for carrying storm water. The best plan to accomplish this, in my judgment, is to construct an intercepting sewer which can collect all the sewage carried by sewers already, or which may hereafter be constructed.

Your present sewers are planned to carry both sewage (household drainage, etc) and storm water. It will not be necessary to carry storm water in the intercepting sewer. Only the dry weather flow of the other sewers needs to be intercepted, arranging for storm overflows into the river. For this reason a comparatively small pipe sewer will suffice for the intercepting sewer. Your city engineer estimates that the expense of such an intercepting sewer need not greatly exceed five thousand dollars—a small price, surely, to remove such a nuisance as now exists.

In locating the outlet of the intercepting sewer the probability of sewage purification being ultimately required should be kept in mind. As has been stated the Sandusky river in dry seasons does not afford sufficient water to dilute the sewage to an extent to prevent its decomposition with accompanying bad odors. The intercepting sewer, therefore, would only remove the nuisance from city limits. Eventually a nuisance would doubtless be created at the place of its discharge, and this nuisance could only be abated by purifying the sewage before turning it into the river. This is now being done at Canton and Oberlin, and purification works have been commenced at Alliance and Fostoria. There is every reason to believe that within a few years all inland cities will be driven to the purification of their sewage; and whatever plans are adopted for dealing with the sewage of your city should keep this end in view.

REPORT ON NUISANCE AT CELINA AND ST. MARY'S.

BY R. D. KAHLE, M. D.

To the State Board of Health:

GENTLEMEN: In pursuance of a telegram from Dr. Probst, stating that it was reported that quantities of putrid fish were being sold at Celina and St. Mary's, and requesting me to investigate, I make this report:

I went to Celina on the 22nd of March and to St. Mary's on the 23rd. While in Celina I drove along the bank of the reservoir and saw thousands of dead fish along the shore and the edge of the ice. I could also see fish that were frozen in the ice. These fish must have been dead for some time. It is estimated that tons of fish have died in the reservoir this winter.

Mr. Charles Medford, Game and Fish Warden, who lives at Celina, informed me that a great many fish that were frozen in the ice, and must have been dead for some time, were cut out, and fish picked up along the border when the ice broke up, were sold.

It is estimated that tons of these fish have been shipped from the reservoir, Celina being one of the shipping points. I was told by responsible persons that at St. Mary's also the fish have been cut out of the ice and shipped; but the ice not having broken up so much there, as at the other end of the lake there were not so many dead fish.

Most of the fish have been shipped to Cincinnati, Hamilton, Dayton, Indianapolis, St. Louis, Fort Wayne, Lima and other places.

REPORT ON A NUISANCE AT CHILICOTHE CAUSED BY WASTE FROM STRAW BOARD WORKS.

BY THOS. C. HOOVER, M. D.

To the State Board of Health:

GENTLEMEN: By request of the secretary, who was compelled to go to Bellaire, I visited Chillicothe to advise the board of health as to what might be done toward abating the nuisance produced by the discharge of the waste from straw board works at Circleville. The complaint is that it has created an offensive smell along the course of the canal.

The waste from the paper mill is discharged into the river at Circleville and finds its way into the canal through a feeder some distance below the mill. During the recent drought the smell has grown to such proportions as to be a great annoyance to the people living in the vicinity of the canal.

Just prior to the time of my visit some rain had fallen and the smell was not noticeable, but the appearance of the water was black and disagreeable. It was alleged that fish had been killed in quantities. Of that I had no evidence from observation.

Upon my arrival in the city I called upon the health officer, Dr. Cole, and with him upon Dr. Hanley, a member of the board. After hearing a statement by these gentlemen, we called upon the Prosecuting Attorney, Mr. Paul Cooke, a very agreeable young man, who was much interested in the question. The attention of the prosecutor was called to the section of the statutes which dealt with the pollution of streams of water, and I suggested, that in my opinion, their remedy lay in prosecuting under Section 6921 of the Revised Statues

Promising to send them all the literature we had on the subject and that we would lend them all the aid in our power, I left them satisfied that the remedy was in their own hands.

INVESTIGATION OF THE POLLUTION OF THE BLANCHARD RIVER AT FINDLAY.

BY C. O. PROBST, M. D. AND JOSIAH HARTZELL, PH. D.

To the Board of Health, Findlay, Ohio:

GENTLEMEN: At your request the above committee of the State Board of Health visited your city on the 6th of August and inspected the Blanchard river with reference to its pollution by sewage, and with a view to suggesting a remedy for the nuisance created thereby.

It has been suggested, and we were called upon to approve or disapprove the plan, that by building a dam a short distance below where the major part of the sewage enters the river, so as to cover over the bare bed of the river, the nuisance could be removed.

It is our opinion that this plan would give but partial and temporary relief. Covering over the bed of the river by damming the water would undoubtedly very much improve the *appearance* of the river, but during dry season's of the year the river's flow is insufficient to dilute the sewage to an extent to prevent its decomposition, and even with gates in the dam for flushing, we think a nuisance would inevitably be created, and do not therefore approve of that plan.

In our judgment it will be necessary to carry the sewage to a point below the city in order to abate this nuisance. We would suggest that whatever plans are carried out in this direction they be made a part of a general plan looking towards ultimately conveying all the sewage of the city, allowing for future growth, to one point, where it can be purified before discharging it into the river.

An intercepting sewer designed to carry only the dry weather flow of the Main Street and Court House sewers, and discharging, temporarily, into the river some distance below the Main Street bridge, would give immediate relief as regards the worst of the conditions now existing at this bridge. This sewer, which need not be large, could be built at a comparatively small cost, and could be made a part of the general system for caring for all of your sewage, which will doubtless be built in the near future.

As soon as possible the Main Street sewer should be abandoned xcept for storm water. It was built mainly to drain the soil, and was

purposely constructed with open joints to accomplish this end. By permitting house connections to be made with it, there has been caused not only the nuisance due to discharging sewage into the river at an improper place, but such pollution of the soil along its course as is a constant menace to those living in its vicinity. No house connections should be permitted with any sewer constructed for storm water purposes only; and the attention of your council will be called to the storm water sewer now being constructed, with its outlet into Eagle creek, in order that steps may be taken to prevent the creation of a nuisance at this point. Any new outlets or changes of outlets of your present sewerage system are required by law to be approved by the State Board of Health.

INVESTIGATION OF THE POLLUTION OF PICKLE RUN AT GALION.

BY C. O. PROBST, M. D., SECRETARY.

To the Board of Health, Galion, Ohio:

GENTLEMEN: At the request of your board I made an investigation of the pollution of Pickle run, and have the honor to report as follows with respect to the measures required to abate the nuisance caused by such pollution.

Pickly run is a small stream flowing through a thickly settled part of the city, and empties into Whetstone creek within city limits. Its flow, though constant, is very small in dry weather. It is more or less polluted along its entire course with drainage from water closets and privy vaults. It has been estimated that the closet drainage of 800 people or more enters this run. The result has been the creation of a very bad nuisance affecting the comfort and property interests, and seriously menacing the health of a large number of people. That this nuisance should be abated every one acknowledges. How this should be done may admit of discussion.

Three ways may be suggested: First, by converting the run into a covered sewer, either by covering it over or by laying a pipe in its bed of sufficient diameter for storm water and sewage. This plan would only transfer the nuisance from one part of the city to another. In dry weather there is no flow in Whetstone creek above where Pickle run empties into it, and the filth of Pickle run has already created a nuisance in the creek at the point where the run discharges, and below. In my opinion this plan should not be undertaken.

Second, the pollution of Pickle run may be stopped by prohibiting the drainage of all water closets, privy vaults or other filthy matters, into it, the run being used to carry off storm water only. This plan is the only one that can be adopted by the board of health, as the board has no authority to order the construction of sewers.

Your board undoubtedly has authority to prevent the pollution of Pickle run. Section 2116 of the Revised Statutes provides that "The board of health shall abate or remove all nuisances within its jurisdiction." "The board of health may regulate the location, construction, repairs, use, emptying and cleaning of all water-closets, privies, cess-pools, sinks, plumbing, drains, yards, pens, stables or other places where offensive or dangerous substances or liquids are or may accumulate."

Section 6921 Revised Statutes provides, that "Whoever corrupts or renders unwholesome or impure any water-course, stream, or water, shall be fined not more than five hundred dollars."

It would doubtless work a considerable hardship to prohibit the use of Pickle run for drainage purposes, and I would not advise your board to enforce this measure except as a last resort.

The third plan to be suggested, and the one I would recommend, is to build a small pipe sewer exclusively for sewage purposes, located so as to receive all the filthy drainage now discharged into Pickle run. This sewer should be so arranged as to connect with the outlet of the sewerage system already built, so that there will be but one outlet.

I was unable to consult with your city engineer, but from a map in his office showing elevations, it appears possible to carry sewage from all parts of the city to the present outlet into Whetstone creek. It is essential that one outlet for the whole system be found, as it is more than probable that in the near future the city will be compelled to purify its sewage before turning it into Whetstone creek. This stream is too small to carry off the sewage emptied into it even now without creating a nuisance.

If this plan is adopted Pickle run can be allowed to remain as a natural drain for storm water only; but as it would still receive filthy matters washed from the streets, and as it would require close watching to keep people from throwing objectionable things into it, it would be much better to have the run covered over.

I am informed that the majority of the people living along this run are in favor of sewers, and I would therefore recommend that the matter be laid before council by your board, with the recommendation that a sewer to relieve Pickle run be constructed at the earliest possible date. With this end in view it would be well to suggest that plans should be prepared, showing the size, route, outlet and estimated cost of construction

of the sewer, so that your citizens may have an intelligent idea of what it is proposed to do.

If no steps are taken to provide sewerage, as recommended, it would become the duty of your board to adopt measures to enforce the second plan recommended, viz., to prevent the pollution of Pickle run.

REPORT ON THE POLLUTION OF RITTER'S RUN.

BY C. O. PROBST, M. D., SECRETARY.

To the Board of Health, Madison Township, Richland County, O.

DEAR SIRS: At your request I inspected Ritter's run on July 18th, with special reference to its pollution by sewage from the city of Mansfield.

In company with members of your board I examined the creek from city limits to several miles below. The creek for at least two miles from city limits showed decided evidence of sewage pollution, and was in a very offensive condition. There can be no question about a nuisance existing from befouling of this stream, and no question, I think, that the sewage of Mansfield is mainly the cause of it.

Section 6921 of the Revised Statutes of Ohio provides that "Whoever * * * corrupts, or renders unwholesome or impure, any water-course, stream or water * * * shall be fined not more than five hundred dollars." Municipal corporations may be prosecuted for the creation or maintenance of nuisances the same as private individuals.

There is not sufficient water in this stream in dry weather to so dilute the sewage of Mansfield as to prevent the creation of a nuisance, and I see but two ways by which this nuisance can be abated. First, to prohibit the city of Mansfield from turning its sewage—that is house drainage or other filthy matter—into the stream. Second, to require the city to purify its sewage before permitting it to enter the stream.

While it is not impossible for a city to exist without sewers, it would work great hardship on the people of a city to prohibit the use of sewers already introduced. It is easily possible for a city to purify its sewage, and this Mansfield should be required to do. Canton and Oberlin, in this State, have already constructed works for this purpose, and Alliance is preparing to do so.

I would suggest that you ask the persons who are aggrieved by this nuisance, and who live in your township, to present a petition to your board requesting that steps be taken to abate the nuisance. The matter

should then be laid before the council of Mansfield with the request, by your board, to abate the nuisance. If at all possible this matter should be amicable adjusted; but if nothing is done by the city towards abating the nuisance, your board should take steps to have it abated. Whether it would be best to bring suit against the city for creating and maintaining a nuisance, or whether an injunction could be secured, restraining the city from discharging foul matters into the stream, I am unable to say.

You may depend upon any assistance this Board is able to give you in the matter.

REPORT ON A NUISANCE AT NEW CONCORD.

BY C. O. PROBST, M. D., SECRETARY.

To the Board of Health, New Concord, Ohio:

DEAR SIRS: At the request of the clerk of your board of health, I visited your village June 7, and accompanied by members of the board and others interested investigated an alleged nuisance resulting from the pollution of a run or water course which forms a part of the natural drainage system of the village.

This run is in the form of a Y with the school house between its branches. The school house privies stand near one branch of the run. These are provided with boxes above ground, but as they are not water tight foul liquids escape and enter the run. On the other branch of the run there are one or two privies which possibly contribute to its pollution.

A year or more ago a creamery was erected near the run which has a small tile drain leading to it. It is claimed by those in charge of the creamery that no filthy drainage is permitted to enter the drain. I may say that at the time of my inspection the creamery itself was in a very cleanly condition, and there was no collection of foul matter and no bad odor at the point where the drain from the creamery enters the run. It was stated, however, that the run had recently been washed out by rains, and that bad odors at the place where the drain discharges, and apparently due to waste water from the creamery, had been noted on former occasions. Your board is doubtless informed as to the facts in the case.

The two runs converge to a sewer, forming the stem to the Y, which passes under the road and discharges into a kind of large wooden trough. It is at this point that the greatest nuisance has been committed. An open ditch from this point carries the drainage across a bottom and into a small stream. A privy on the bank of this ditch drains into it,

and adds considerably to its pollution. The ditch was greatly obstructed by grass and weeds, as were also the two runs before they join the sewer. The existence of a nuisance will be admitted by all. In my opinion this can only be abated by providing a free, unobstructed outflow for surface drainage throughout the whole course of this run, and by keeping filthy matters, as far as possible, out of it. No privy should be permitted to drain into the run, either directly or indirectly.

As there is a question as to whether drainage from the creamery contributes to the nuisance, other sources of pollution should be first removed, and if the nuisance continues to exist, the creamery should not be permitted to drain into the run.

The run itself should be freed from grass and weeds. That part of it below the road is quite flat, and there may be a tendency for water to remain there. If a half sewer were laid in the bed of this part of the run, this difficulty would be removed.

There can be no question as to the authority of your board to abate this nuisance. I would refer you to sections 2116, 2122, 2128, 2137 and 6921 of the Revised Statutes of Ohio.

REPORT OF AN INSPECTION OF OBERLIN'S SEWAGE FARM.

BY BYRON STANTON, M. D., AND C. O. PROBST, M. D.

It having been reported to the State Board of Health that the sewage disposal farm of Oberlin was causing a nuisance on account of the pollution of Plumb creek, and by reason of noxious odors arising from the farm itself, an inspection of the farm and Plumb creek was made on July 19, 1895.

A description of the farm, and also a report of its inspection, made by one of us June 20, 1894, may be found on page fifty-one of the ninth annual report of the State Board of Health. It may be stated that at that time the condition of Plumb creek at and below the farm was good, there being no evidence of its pollution, and no bad odors were noticeable coming from the farm, except odor of fresh sewage, which could not be detected outside of the farm limits.

The present year has been exceptional with respect to rainfall. Observations at Oberlin show that during the months of April, May and June, 1895, there has been a total deficiency of 3.34 inches. On the 8th of July a trace is recorded, and on the 15th, 27 hundredths of an inch. Plumb creek has had therefore considerable less flow than usual; and the proper disposal of sewage at the farm has had a severe trial. During

April and May trouble was experienced with the sewage filter beds on account of a tendency for the land to crack, when exposed for aeration, thus permitting unfiltered sewage to escape into the under drains. Difficulty has also been had because the trenches containing the drains were not puddled when these were laid, the sewage tending to cut its way too readily through the soft earth to the drains. As a consequence, for a time considerable unpurified sewage found its way to the stream, and occasioned more or less of a nuisance.

These faults were remedied as soon as possible by digging up the filtering beds over the trenches for a depth of two feet and back filling with puddle. Since that time—the latter part of May—there has been no trouble, so far as we could learn, from unpurified sewage entering the creek from the filter beds.

One-half of the farm has been laid out for irrigation, being underdrained only in a few low places. For a part of the time sewage has been disposed of on this field, and had been so placed for a week prior to our visit. A carrier ditch near the road which separates this field from the filtration beds has been constructed with banks at one place of soft earth. At one time sewage cut through the bank, escaped into the road, and possibly reached the creek. This existed but a short time, and the bank was easily repaired. One of the carrier ditches approaches within about eight feet of Plumb creek, but has no direct connection with it, and sewage to reach the creek must filter through the bank.

The ground of the irrigation field is at present so dry that the sewage is soaked up in a very short time.

The sludge from the sludge pits is disposed of in a manner noted in a former report, viz, by pumping it into a water tight wagon bed and spreading it over the field above the sewage beds.

Some changes have been made, by way of experiment, in some of the filter beds. In one or two, the earth has been rounded up over the underdrains, so that sewage will filter to them latterally. In another place shallow pits were dug between underdrains, with the same object in view. The farm was in good condition, free from odor, except where sewage was flowing. At such places there was an odor of fresh sewage, but this was not noticeable a short distance away.

Several persons were found who testified that at different times disagreeable odors, apparently from the farm, could be detected on the public road which passes by, and also in houses near the farm. From what we could learn this had not been of recent occurrence. Plumb creek was in as good condition as streams of that character, not receiving sewage, usually are in dry seasons. It was examined for several miles along its course above and below the sewage farm. The stream had stopped flow-

ing, and water was standing in pools at various places. Many of these were stirred and the character of the sedimentary deposit in them examined. In most instances the water in these pools was without odor. At places where trees overhung them the decaying leaves which had fallen into the water gave it a vegetable odor. In no instance could evidence of sewage pollution be detected by odor, even in the water of the creek on the sewage farm. The worst place found was in pools just above the farm, to which cattle had access. There is still a small quantity of sewage turned into Plum creek in Oberlin, which pollutes it to some extent before it reaches the farm.

There appears to be less water in the creek above the sewage farm than below it, and this might be expected, as much of the water taken from Vermillion river for the public supply reaches Plumb creek through the sewage farm.

We are convinced that at the present time no just cause exists for complaint with respect to Oberlin's sewage farm. Plumb creek, if not improved, is at least no worse for receiving Oberlin's purified sewage. The farm itself is not in a condition to create a nuisance, though doubtless at times odors from it have reached persons in its neighborhood.

Improvements for dealing with the sewage will doubtless be made. While time and usage have firmly established the broad principles of sewage disposal by filtration and irrigation, and satisfactory results have been obtained by each method, every sewage farm presents minor problems of its own which can only be solved by repeated experiments. We believe that the present board of sewer commissioners is fully in earnest in its endeavors to obtain the best possible results at Oberlin, and feel that they are to be congratulated on having already accomplished so much in this direction.

As the results achieved at Oberlin are of far more than local importance, and are being studied by many of our towns similarly situated, we are glad to be able to report that in our judgment the system they have adopted has been a success, and may be recommended, where conditions favor, to all places, and especially small cities, where purification of sewage is required.

We desire to acknowledge with thanks courtesies extended to us by members of the board of sewer commissioners, members of the board of health, and by the city engineer.

REPORT ON A NUISANCE AT PERRYSBURG.

BY C. O. PROBST, M. D., SECRETARY.

MR. F. E. HOLLENBECK, *Sec'y of the Board of Health, Perrysburg, O.:*

DEAR SIR: At your request I visited your village on the 5th instant, and, accompanied by you and other members of your board of health, made an inspection of what is known as "Crooked Run." This run affords an outlet for the surface drainage of a large part of the village. It is very tortuous in its course, and at present is overgrown with grass and weeds. In numerous places depressions in the run give rise to pools of stagnant water. On account of its crookedness and overgrowth of grass and weeds, filthy matters, reaching the run, are deposited at various points, and by their decay give rise to noxious gases and bad odors. A nuisance is thus created which should be abated by your board.

This can only be done by cleaning and straightening the run, and by keeping filthy drainage out of it. The best plan would be to lay a half sewer in the bottom of the run. This could easily be kept clean.

The railroad company drains its privy into the run. This should be stopped at once.

As requested by you, I consulted the Attorney-General in regard to the powers of your board to abate this nuisance. He is of the opinion that your board is authorized to abate nuisances of this character. He suggests that citizens who are aggrieved by the nuisance should join in a petition to your board to have it abated. Your board should then serve a notice on the council, requesting them to abate the nuisance, as the corporation is at fault in not providing proper means for the removal of surface and filthy drainage. If council does not abate the nuisance then it should be done by the board of health, and the expense so incurred should be certified to council, as are other expenses of the board of health.

I trust that this nuisance, which is detrimental to the health and comfort of your citizens, and to the fair name of your village, will be speedily abated.

REPORT ON AN ALLEGED NUISANCE IN PERRY TOWNSHIP, WOOD COUNTY.

BY C. O. PROBST, M. D., SECRETARY.

In the spring of 1893, a petition was received from the residents of West Mill Grove, Wood county, requesting this Board to examine the proposed outlet for the sewerage system of Fostoria then being constructed.

As the sewage was to be discharged into a small stream, often nearly if not quite dry in summer, it was feared that a nuisance would be committed.

Dr. Kahle and myself were appointed to make an investigation. We visited Fostoria May 24, 1893; a report was made to the Board on the subject which is published on page eighty-seven of the eighth annual report. In this report the committee stated in regard to the pollution of this stream "the plans contemplate ultimately the purification of the sewage either by intermittent filtration, for which purpose a sufficient amount of land has already been purchased, or by precipitation. Your committee is therefore of the opinion that there is no occasion for further action to be taken by this Board at the present time."

On May 25, 1895, the following petition was presented to the Board by members of the Perry township board of health and their attorney:

COLUMBUS, OHIO, *May* 25, 1895.

To the Honorable The State Board of Health of the State of Ohio:

GENTLEMEN: You are hereby called upon by the township board of health of the township of Perry, county of Wood, and State of Ohio, to investigate the outlet of the sewerage system of the city of Fostoria, and also the disposal of the excreta therefrom.

Respectfully, the board of health of Perry township, Wood county, Ohio, by its president and secretary.

A. S. BROWN,
J. W. SMITH.

On June 4, I went to West Mill Grove, and, with members of the township board of health and others, drove from the village to Fostoria, inspecting the stream in question at various points along the route. The stream presented signs of sewage pollution from below the village to the outlet of Fostoria's sewer. Except at the outlet of the sewer bad odors were not specially noticeable, although a black, ill-smelling muck could be collected from the bottom of the stream at the various points examined.

A number of fine farm houses are located close to this stream along the route examined. I questioned several of the owners, and they testified that at times, especially at night, very bad odors came from the stream.

At the sewer outlet the stream, which is close to a public highway much traveled, was very foul, and the odors from it were plainly perceptible for some distance away.

I was informed that a dairyman who pastures cows on land a short distance below the sewer, the cows having access to the stream in question, had been notified by the board of health of Fostoria that he would not be permitted to sell milk in that city if his cows were allowed to drink at this stream. Certainly the water is not fit for dairy cows to drink.

A nuisance is undoubtedly created by discharging the sewage of Fostoria into this small stream.

The engineer of Fostoria, and the Chairman of the Sewer Commissioners called on me at the office subsequent to my visit there, and expressed themselves as desirous of taking steps to purify their sewage.

I would recommend that a conference of a committee of this Board, of the Perry township board, and of the sewer commissioners of Fostoria, be held at Fostoria at an early date, to see if some plan cannot be agreed upon which will be satisfactory to all concerned.

I may say that the township and Fostoria authorities favor such a meeting.

OHIO STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY, COLUMBUS, O., *June* 24, 1895.

MR. A. S. BROWN, *President*,
MR. J. W. SMITH, *Clerk*,
Township Board of Health, West Mill Grove, Ohio:

DEAR SIRS: I enclose herewith a copy of a report on the alleged nuisance in your township, which was presented at a meeting of the State Board of Health, held in Toledo, June 19, 1895.

The report was approved by the Board, and the following resolution in reference thereto was adopted:

Whereas, Complaint has been made to the State Board of Health by citizens of Perry township of a nuisance arising from the delivery of Fostoria's sewage into East Portage creek, and

Whereas, Said complaint has been confirmed by personal examination and by admission of the corporation officers of Fostoria, and

Whereas, Messrs J. P. Force, Engineer; U. Burtcher, Sewer Commissioner and T. J. Snyder, Solicitor, have promised that a plan of sewage purification should be built at once, plans to be submitted to this Board inside of ten days, therefor be it

Resolved, that if there is undue or unnecessary delay on the part of Fostoria in planning and building proper disposal works, the citizens of Perry township are hereby advised to inaugurate steps to compel proper action with a view to so purifying the city sewage and abating the nuisance complained of; and also to this end this Board will render all the aid in i s power.

Yours truly,

C. O. PROBST, *Secretary.*

REPORT OF POLLUTION OF MAHONING RIVER NEAR YOUNGSTOWN.

BY THOMAS C. HOOVER, M. D.

To the State Board of Health:

GENTLEMEN: In obedience to the request of Dr. Stanton I visited Youngstown, leaving Columbus September 29, at noon. Upon arriving

there I telephoned the health officer, and succeeded in getting three of the members of the board of health and the health officer to meet me that evening.

The complaint was that something had killed a number of the fish in the Mahoning river, and, as the city derived the water supply from that river, it was feared that there might be danger to the consumers. They desired us to investigate and, if possible, ascertain the cause of the fish being killed.

The Mahoning river is the most beautiful seen stream that I have within our State. Its course is through a rocky and gravelly country, and in its natural condition would be clear and wholesome. Under existing circumstances, with its bank lined with various manufacturing enterprises, each of which exercises the privilege of discharging its waste products into the river, it is converted into an open sewer.

Nine miles above Youngstown is located the town of Niles, with a population of about 4,000. At the lower boundary of Niles are a tin mill and a galvanizing plant. At the galvanizing plant a bath of a three per cent. solution of sulphuric acid is used to remove the scale from the sheets of iron preparatory to galvanizing. Every forty-eight hours this bath is emptied and discharged into a little creek near its mouth. The waste from the tin mill does not contain anything of a chemical character, and is insignificant in quantity. Niles is not sewered, and is situated on rolling territory that drains into the little creek referred to above, and also into the river. The water in the river for a distance of about two miles, beginning at a short distance above Niles, presents a peculiar reddish-yellow color; and the shore from Niles to below Girard is colored in the same way. At Girard a dam is constructed across the river and the effect is to back the water above Niles. The sulphuric acid bath dissolves the scale from the iron sheets and carries it in solution into the river from the little creek. In all probability the color spoken of is due to the oxidation of the iron.

At Girard, just above the dam, a tannery empties its waste into the river. Girard is situated on the north shore of the river and drains into it.

At Briar Hill a large blast furnace is located—about one mile above the intake of the Youngstown water works. Just about the time the fish had been discovered this furnace had been cooled down by throwing water into it. It was stated by the chemist of the furnace company that cyanid of potash would be present in the discharge from the furnace, and that might be a solution of the fish question. It should be remembered, however, that the fish had been dying before the furnace was cooled.

Several small tributaries empty into the river between Niles an

Youngstown, but I was told that nothing along these streams was considered detrimental as they flowed through an agricultural district.

On the opposite side of the river, a short distance above the intake of the Youngstown water works, a large steel plant empties its contribution to the further pollution of this beautiful stream. I was informed that nothing especially objectionable was to be found in this, as it was principally composed of the water that was used in cooling the rolls and a small proportion of grease (suet) that was used in greasing the rolls.

At the time of my visit a few dead fish were seen along the river from Girard down the stream close to the water works intake. They were in advanced stages of decomposition, and none were seen that seemed to have come to an untimely end within a very short time previous.

Samples of water were taken, one just below the galvanizing plant, one just below the furnace and one just above the intake, and sent to Prof. Howard for examination. His report is given below:

COLUMBUS, O., *October* 22, 1895.

DR. C. O. PROBST, *Secretary of State Board of Health:*

DEAR SIR: The samples of water collected by Dr. Hoover from the Mahoning river, between Youngstown and Niles, have been examined by myself with the following results:

No. 1. Mahoning river at Niles. No. 2. Mahoning river below the furnace. No. 3. Mahoning river 100 yards above water works.

Parts per 100,000.

	No 1.	No. 2.	No. 3.
Turbidity	none.	none.	none.
Sediment	marked, reddish.	very slight.	very slight.
Color	.7	.2	.2
Oxygen required	.376	.416	.360
Free ammonia	.0068	.0088	.0052
Albuminoid ammonia	.0242	.0262	.0176
Nitrogen as nitrites	.0015	.0008	.0010
Nitrogen as nitrates	.0266	.0245	.0297
Chlorine	2.15	1.44	.85
Total solids	28.0	29 7	29.5
Temporary hardness (carbonates)	10.3	11.0	11.2

A sample received October 17, marked, "Water from river above Niles bridge, not contaminated by outflow from galvanizing works," had a temporary hardness of 13, and this may be taken as representing the carbonates normally in the river. A sample received the same date, and marked "Water from river at Niles, just below the outflow from galvanizing works," had a temporary hardness of 2.1 parts per 100,000. This indicates that the normal amount of carbonates (13 parts) had been reduced by the action of the acid to 2.1 parts, and that even at this point the carbonates had not been entirely decomposed, and that consequently there was not an excess of acid. In sample No. 1, taken, it must be inferred, not so close to the outflow, the carbonates were 10.3, a reduction of 2.7 parts below the normal carbonates of the river water. At the furnace the effect of the acid seems to be reduced as indicated by 11. parts of carbonates, while 100 yards above the water works the carbonates are increased to 11.2 parts. It is

interesting to note that in a sample of water from the public supply of Youngstown received September 19, the temporary hardness indicating carbonates was 11.5 part, per 100,000. As the worst sample submitted contains carbonates, and as in the body of the river the reduction of carbonates which *may* be due to the introduction of acid at the galvanizing plant, while indicated in the results, is not excessive, it is difficult to see how the death of the fish can be ascribed to this cause. The organic analysis shows that the water is not of very good quality, but there are many streams containing water more polluted than this in which fish continue to live, so that a reason cannot be found here. I have no information as to any other chemicals than the sulphuric acid that are introduced into the stream, and so have not investigated further.

Yours truly,

CURTIS C. HOWARD.

It must be borne in mind that the water in which the dead fish were found is the same water that is being supplied to the citizens of Youngstown for drinking purposes. That the dead fish, as stated above, were found in close proximity to the intake of the water works. That no bad results were realized from the use of the water by the people.

Pending the examination by Prof. Howard, a letter from the health officer stating that the fish were still dying, was received.

Inasmuch as nothing has been found by chemical analysis to throw any light upon the matter, I am unable to offer any explanation.

I may be permitted to add that the pollution of the Mahoning river is outrageous, and should be prohibited. From the hurried survey of the surroundings that I was able to make on my visit it is my opinion that it is, necessarily, the source of water supply for the towns along its banks, and that the preservation of its purity is a matter of vital importance to them.

REPORT ON THE ASHLAND COUNTY INFIRMARY.

BY JOSIAH HARTZELL, PH. D.

MR. PRESIDENT: I visited the Ashland County Infirmary on March 7. It is situated about six miles east of Ashland. The farm is more than 200 acres in extent. The location of the buildings is upon a commanding eminence, and is, sanitarily speaking, all that could be desired.

The present superintendent, Mr. G. W. Brindle, courteously afforded needed facilities for observation. The care bestowed on the inmates, thirty-seven in number, seemed to be kindly and judicious, but a proper attention to their comfort and well being is rendered impossible under existing conditions. These comprise, first of all, the buildings.

The house is of wood, very old, the plastering coming off in many places. In its construction no provision was made for heating, except by stoves; none whatever for ventilation, or sanitary living in any sense.

Although the house has only two stories it is so wide that room was made under the gable roof for thirteen bed rooms. These are perfectly dark rooms which have no openings except the door into the corridor. They are of necessity very hot in summer and very cold in winter. The female inmates occupy bed rooms on the second floor which have the advantage of windows. There being no heat provided for any of the above rooms the inmates occupy larger rooms on the first floor, heated by stoves, during the day.

The second and third floors are reached by one steep stairway, and there is no other provision for escape in case of fire.

The water supply is very limited, being obtained from a well in the yard, with wind mill pump. This well, 140 feet deep, went dry last summer and water had to be hauled from springs at a distance.

The arrangements for sewerage, or disposal of wastes, would be a reproach to any people. The insane, and the women who can go out, are accomodated in a large, poorly constructed privy. The dejecta fall into a long shallow pit which drains into ten-inch sewer pipe. The latter passes under the surface about fifty feet, then under another privy. There the drain empties into an open ditch at a point less than 100 feet distant from the insane department. There is no water and no flushing, and the flow away of the sewage is necessarily sluggish. The superintendent makes free use of deodorants and disinfectants, but under such conditions he is powerless to prevent a real nuisance.

The men are compelled to visit a place on the other side of the house, and a considerable distance away. It is spoken of as a "place" because it hardly reaches up to the dignity of a privy. When the dejecta accumulate the mass has to be shoveled up and hauled away.

The provisions for the care of the insane leave a great deal to be desired. All the rooms were freshly scrubbed and clean as mop and brush could make them, but the obstacles in the way of a proper care of these unfortunate people were far too great to be remedied by such simple methods. The second floor of the insane building, which is at some distance from the main building, is occupied by feeble and aged women. These persons have to go out to the privy, and to the main building for meals. Concerning this feature the Board of State Charities, on the occasion of the last visit of the committee, says: "These women are unprotected from the scorching heats of summer and from the storms and ice of winter."

Immediate temporary arrangements should be made for the rescue of inmates in case of fire; also for the ventilation of the men's sleeping rooms on the third floor; also for a more decent and less dangerous dis-

posal of wastes; also for better heating and a more liberal supply of water.

The construction of a new permanent building and such other improvements as will render possible a plain, comfortable, healthy existence, should also engage immediate attention.

REPORT ON INSPECTION OF THE FAIRMOUNT CHILDREN'S HOME.

BY JOSIAH HARTZELL, PH. D.

The Fairmount Children's Home is the joint property of Stark and Columbiana counties. Appertaining to the home is a farm of several hundred acres. The institution is located in Stark county, four miles south of the city of Alliance. The collective population of the Home, comprising children, teachers, attendants, etc., averages about two hundred.

As a result of a visit of inspection to the home by the Stark County Visiting Board, formal complaint was made to the Ohio State Board of Health, June 10. I was instructed by President Stanton to investigate the causes of complaint and report thereon. By reason of a happy accident it was rendered convenient for Dr. C. O. Probst, Secretary, to accompany me on the occasion of my visit, July 11.

Aside from the plumbing in the buildings, the drainage outside and the manner of waste disposal, there is nothing to complain of. These are pretty much all wrong. The sewer pipes, the waste pipes, all the underground system should be replaced by new, properly built work, and new closets should take the place of the slouchy and dangerous privy arrangement now in use.

The traps are defective. Their puttied joints stand open and leaky. Important protective parts are made of tin which has rusted through. The waste sewer, under the entire length of the house, is of common earthenware pipe, laid under a few inches of earth, the joints of which are, in places, open and leaky. This sewer passes only a few inches beneath the wooden floor of the kindergarten room. Escaping steam wastes into it and volatilizes and fills the air with stench. On entering this kindergarten room the nose was instantly assailed by the characteristic sewage smell. Both children and teachers have been affected with throat diseases and other maladies arising from such insanitariness.

The wastes pass by a six-inch pipe sewer into a dry run about 1,000

feet from the main building. This pipe is broken and leaks in several places.

The channel of this run is foul beyond expression. More so than usual at the time of our visit, by reason of the continued dry weather, resulting in the retention of the decomposing sewage in the bottom of the run. Storm water freshets scour the run of a large part of its sedimentation and carry the same over the premises of farmers below, and on into the Mahoning river above the water works intake of the city of Alliance. The farmers complain of the damages to which they are subjected. The superintendent of the Alliance water works seized the occasion to advise me that his company had just determined to employ an attorney with a view to rectifying the injury which menaced the city's drinking water supply.

It is recommended that the County Commissioners of Stark and Columbiana counties take speedy measures to remedy these defects. Imperiled health renders the case urgent.

It is recommended that a sanitary engineer have supervision of plans and work.

It is recommended that the output of the sewer be purified before admitting the water into the run. The sewage reaches the banks of the latter at a sufficient elevation to admit of land purification, or of either of the methods of treatment that have been approved by experience.

INSPECTION OF A SCHOOL HOUSE AT LOUDONVILLE, ASHLAND COUNTY.

BY C. O. PROBST, M. D, SECRETARY.

The Board of Education of Loudonville reported that, more room being needed for pupils, they were being urged to fit up basement rooms in their school building for school purposes. It was feared that these rooms would prove to be unhealthy, and the board favored a temporary building, not having sufficient funds to erect a permanent school house. They were threatened with injunction proceedings if they attempted to build, and the State Board of Health was called on to pronounce on the fitness of the basement rooms for occupancy.

I went to Loudonville on the 14th instant, and in company with the school board and members of the local board of health, examined their school building—they have but one. This is a brick building of ten rooms; eight of these are 25x40, and two are 15x40. Their present

enrollment is 540; and last school year they had as many as eighty-four pupils in one room. The rooms are heated by steam coils, the boiler being placed in the basement, and are ventilated by shafts which open into the attic. Each one of these ventilating shafts was found closed by a tight tin cover, placed there, it is supposed, to prevent children falling into them. Ventilation has thus been stopped for no one knows how long.

The basement corresponds to the rooms above, and is about seven feet below, and the same, or a little more above ground. It was proposed to fit up two of these basement rooms for school rooms. Each contains three outer windows, having eight panes of glass 16x24 inches. The outer half of the floor and the outer foundation wall were very damp, even wet. This is probably due to leaky eve troughs, which permit water to run down the walls.

It was proposed to fit up the rooms by laying floors two feet above the ground, and to put in inner walls and ceilings. An area way six feet wide and down to the bottom of the foundation walls was to be constructed. No means had been thought of for ventilating the rooms, which would be a difficult task as there is no shaft that can be used.

The estimated cost of these improvements would be about $2,000.

Even if these rooms were in every way suitable for school purposes they would afford but temporary relief. They would be at once filled by an overflow from already overcrowded rooms; and in a few years more room will be required, and another school house will have to be built. The basement rooms would then be abandoned as parents now and always will object to sending their children to what is already known as "the cellar."

In my judgment these basement rooms would be deficient in light, and it will be difficult to render them sufficiently dry, or to ventilate them so as to place them in good sanitary condition.

For $1,800 a four room frame building can be erected on the school lot, which is sufficiently large, or two rooms equal in capacity to the basement rooms can be prepared for about $1,200. Temporary relief with suitable rooms can thus be furnished at a less cost than will be required for fitting up basement rooms, which will always be more or less objectionable.

I would recommed, therefore, that the use of these basement rooms for school purposes be condemned.

OHIO STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
COLUMBUS, OHIO, *June* 24, 1895.

MR. G. W. OSWALT, *Clerk of the Board of Education, Loudonville, O.:*

DEAR SIR: I enclose herewith a copy of a report of the inspection of your school house, which was submitted to the State Board of Health at a meeting held in Toledo, June 19, 1895. The report and recommendations were approved.

Yours truly,

C. O. PROBST, *Secretary.*

REPORT ON SANITARY CONDITION OF JAIL AT OTTAWA, PUTNAM COUNTY.

BY R. D. KAHLE, M. D.

MR. PRESIDENT: On January 15, I visited the county jail at Ottawa, Putnam county, complaint of which had been made to this Board. I was shown through the jail by Sheriff B. F. Burgess, who seemed willing to give all information he could in regard to the jail, and who is anxious to have its defects remedied.

The jail is an old one, having been in use about thirty years. It has six cells for prisoners, three on each side. It is heated by old fashioned wood stoves, one on each side. When I visited the jail there was but one prisoner confined in it. The sheriff informed me that during the winter he had fourteen at one time, so that he was obliged to put two in each cell and also cots in the corridor.

At the end of the corridor, on each side, are the water closets, which are old fashioned, dilapidated iron closets, without water connections, and not properly trapped. They were arranged to be flushed from a tank in the second story, the water to be pumped there by hand; and when they were flushed the water would rush out over the floor. The excrement is dropped into a sewer under the jail, and what little flushing it gets must be by means of water carried in a pail and poured into the closet. It is but little better than an opening through the floor into a vault for the reception of the feces of the prisoners who are so unfortunate as to be confined there.

I see no excuse for harboring such a glaring nuisance in any institution. I am informed that it has been in this condition for years. It is certainly in a most foul and loathsome condition, and during warm weather, I am told, the stench is simply horrible; and I cannot see how it could be otherwise.

This condition could easily be remedied, either by using a dry earth closet, or better still by having the plumbing reconstructed and an elevated

tank which could be filled by a wind mill from a well, or from the roof of the court house, so the closets could be flushed each time they are used.

The closet of the court house is in a very filthy condition, and should be remedied at the same time.

The sheriff informed me that the grand jury has frequently condemned these closets but the commissioners have failed to act. There is a hole in the roof through which rats enter the jail. This could be remedied with but little trouble or expense.

REPORT OF DELEGATE TO THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION HELD IN DENVER, COLORADO, OCTOBER 1, 1895.

DR. S. P. WISE, PRESIDENT STATE BOARD OF HEALTH.

The first paper on the program was that of our worthy colleague, Mr. Hartzell, on the pollution of streams in the Mississippi valley. It was a very interesting and most admirable paper and reflected great credit on the writer as well as on the Ohio State Board. The importance of preventing the pollution of streams was presented in a clear and forcible manner. The paper contained valuable statistical matter, supported by scientific data, and was especially directed toward the monster open sewer with which the State of Illinois is to be afflicted in the near future. The paper must be read to be fully appreciated.

The next paper was by Dr. Bryce, of Toronto, on inter-state co-operation to prevent water pollution. He stated that the increase of pollution on the lake borders in the last decade is twenty-eight per cent, and that the pollution is correspondingly increased—that the typhoid death rate in all the cities bordering on the lakes is on the increase, and that this is notably the case along both sides of the Detroit river—that the lake currents carry the sewage of Port Huron across to a Canadian city—that the city of Detroit pollutes the water supply of Amherst, etc. The writer estimated the degree of pollution of the Detroit river by taking as a basis for his calculation the volume of water, and the per cent. of dilution of sewage which will obtain in the Chicago canal when it is in operation, and presented the matter in figures. In addition to the pollution of the Detroit river by sewage from cities, he called attention to the fact that an enormous amount of sewage and garbage emanates from vessels passing through the river; the number of vessels is estimated as one every five minutes during the twenty-four hours. He recommended inter-state action by the appointment of a commission. He said that Buffalo's

garbage tugs discharged their contents in the near vicinity of the water supply intake of a Canadian city, and he suggested "war" if the matter was not discontinued.

The third paper was by Dr. Salmon of Washington, on Meat Inspection. The gist of the paper was that there is no co-operation between federal and municipal meat inspection. Federal inspection has only jurisdiction where cattle or carcasses are shipped from one state to another. Cattle which do not pass federal inspection may be slaughtered locally and the carcasses sold with immunity. The writer advised co-operation in this matter. Also that the law should apply to slaughter-houses in smaller towns, villages and in the rural districts. He enumerated the diseases which are embraced in the law, and recommended a wider range. He did not insist on microscopic inspection on account of the expense attached thereto. He stated that Germany had trichinosis despite her vigilance in the matter. That the supposed security often leads to negligence in cooking. He also insisted on the inspection of horse flesh.

The fourth paper, by Mr. Jordan of Maine was on Car Sanitation. This was merely a detailed description of car cleaning as practiced by some eastern railroad.

The fifth, by Prof. Woodbridge of Boston, was on Car Ventilation. This was the most excellent scientific dissertation on the subject I ever heard. He read so rapidly that I was unable to catch many of its salient points. The writer first pointed out the material difference between the ventilation of a car in motion and that of a hospital or school building. He gave the cubic feet of air space per capita and the number of changes requisite per hour providing the car is not in motion, which calculations are greatly modified by the velocity of the car and by the direction of the wind currents. He said a system of ventilation must be devised which will not be influenced by these conditions—that vestibules interfere with ventilation—that the heat must be at the floor and the air must be forced in above by means of fans propelled by electricity, and must be properly warmed before it is distributed. This force must be sufficient to be uninfluenced by wind currents. He also stated that the air should be filtered through a wire screen and cotton. He did not solve the problem of an exit for the air; a natural exit is impossible. He concluded his paper by the statement that the complaint that cars are poorly ventilated is often imaginary.

Next in order was a paper by Dr. Orvananos of Mexico, also on the subject of Car Ventilation. He said it is always warm in Mexico, hence the subject has received but little attention in their country. That the air should be changed fifteen times per hour—that car seats should not

be upholstered, so as not to preclude washing and disinfection—that there is no danger of contracting the exanthemata on cars for the reason that patients of that class rarely ever travel—that pulmonary troubles are more frequently contracted by draughts of air than by bacilli. He recommended watchfulness in preventing invalids from traveling, and thorough inspection and disinfection.

The last paper on Tuesday was by Dr. Conn of New Hampshire, chairman of the committee on Car Sanitation. The Doctor complimented the Ohio Board by including in his report the circular which was sent out by our Board to the railroad companies at the time of the cholera scare. The circular was given in full, as also was the response which was sent to us by the B. & O. Railroad Company.

WEDNESDAY.

First in order a resolution was passed requesting the postoffice department to so modify the postal laws as to permit the transportation of bacteriological specimens; and a container was exhibited which renders such transmission free from danger.

Second, a resolution offered by Dr. Hewitt on the death of Pasteur was passed; also a cablegram was sent to Dr. Roux, Pasteur's associate, expressive of deep sympathy.

The paper on Wednesday was by Dr. Horlbeck, of Charleston, on Municipal Steam Disinfection. He exhibited a blue print of a double cylinder which costs about one thousand dollars. The steam first enters the outer space by means of which the goods are first subjected to dry heat before the steam is permitted to enter the inner chamber. Thirty minutes exposure at a temperature of 230° (sixty pounds pressure) kills bacteria which have been developed in thick layers of bedding.

The second paper, by Dr. Chapin of Providence, Rhode Island, was on the same subject. The writer gave a description of the modern methods of disinfection as practiced in fifty of the principal cities of this country and Canada. Rochester and Toledo have the most thorough system of disinfection. They are the only cities which disinfect after measles and minor contagious diseases. Bichloride of mercury and sulphur fumes are the most common disinfectants in use. Only twelve cities out of the fifty considered use steam. Where steam is used the transporting wagons and the clothing of the employe are also disinfected. Thirty-eight cities out of the number have laws on the subject.

It is difficult to ascertain how much good has been accomplished by the disinfection of rooms for the reason that accurate statistics are not obtainable. To make disinfection efficient, an agent must be used which will destroy spores. This can probably be accomplished by the direct

application of 1 to 1,000 bichloride solution. Isolation of nurses important—sulphur fumes unreliable. Formaline has been highly recommended recently.

Dr. Edward Jackson, of Colorado Springs, had a paper on Ocular Hygiene in Schools. The gist of this paper was that children should be taught in the use of their eyes. Fair limits of study and the lighting of rooms should be given due consideration. The point of determination should be the darkest part of the room. The more light the better, so long as the light is not blinding. An arrangement for diffusing and mellowing the brilliant rays and throwing them into the darker corners can be made satisfactory. Black-boards are pernicious on account of the reflection of light. The focus of the eye is changed too often looking from the book to the black-board and back again. A blue board was suggested. Stooping over the desk should not be permitted. A vertical system of writing was recommended. The ocular powers of children should be tested before admission to schools in the same manner as is in vogue in railroad service.

The second paper of the afternoon was on the Outlook for a General System of Registration of Vital Statistics in the United States, by Dr. Wilbur of Michigan. Most of the paper was devoted to a consideration of the death rates according to registration returns, with tables of figures. The state system of registration of deaths are either fairly perfect or the reverse. The returns in many states range from ten to eighty per cent. of the total number of actual deaths. This was demonstrated by a diagram. New York, New Hampshire and Maine have lately adopted a system of registration. The discouraging features are that states having defective systems have not improved them. There is a lack of interest in the matter. European countries and some New England states especially Massachusetts and Rhode Island, have very thorough and satisfactory systems. Maine also has shown commendable care in completing their mortality tables. The United States as a whole is far below the density of population at which a perfect and successful registration can be looked for. It is probable that this will occur about the middle of the twentieth century. In most of our cities of over 8,000 inhabitants the statistics are tolerably reliable. The system put in operation by the United States Weather Bureau will undoubtedly be of great service. A permanent census bureau would be of great value and would lead to more certain information. The paper concluded with the suggestion that the association memorialize Congress for more practical and effective laws.

THURSDAY.

The first paper was read by Dr. W. P. Munn, Health Commissioner of Denver, on National Legislation. The writer first deplored the fact that Congress does not take more interest in the establishment of a National board of health, and that more interest is taken in cattle and hogs than in the welfare of human beings. He suggested the establishment of State laboratories in connection with each State Board of Health supported by an annual appropriation from the National Government. The plan is formulated on the same basis as that upon which was established the Agricultural Experiment Stations which have been an unqalified success in many of the states. State Boards having the usual dribbling allowance that is made for their support by the average legislature, because the members are not politicians of sufficient influence to secure proper recognition, would thereby be placed on a firm financial footing and made capable of doing their proper work. The many advantages that would accrue to sanitary science from the co-operation of forty or more laboratories working by co-ordinate methods upon similar problems could scarcely be estimated. The vast improvement would follow in the sanitation of all local communities in the country, and an incalculable saving of human life, when the trained students of the laboratories in the natural course of events should succeed to the positions of local health officers—now only too often held by pot-house politicians. Dr. Munn submitted the draft of a bill which provides for the establishment of laboratories.

The second paper, by Dr. Gardner T. Swartz of Providence, R. I., was on Bacteriological Results from Mechanical Filtration. In Providence experiments were made to determine the question for the purpose of establishing a plant capable of filtering fifteen million gallons daily. The filters were two of the natural sand bed form imitating the usual filter bed. At the end of seven months the experiments were discontinued, it having been satisfactorily ascertained that the length of run was much less than the mechanical filter before the bed became clogged and the rate of flow in the natural bed was but thirty million per acre in twenty-four hours, while the mechanical filter was run at the rate of one hundred and twenty-five million gallons in twenty-four hours. The paper was replete with facts concerning the construction of filters.

Medical Inspection of Schools, by Dr. Durgin of Boston, Mass., was the third paper; the purpose of which was to give a brief statement of how this work is done in Boston. The city is divided into fifty school districts, giving an average of about four school houses and 1,400 pupils to each district. One physician was appointed by the board of health for each district, salary $200.00 a year. It is his duty to make a visit to each mas-

ter of schools daily, soon after the beginning of the morning session. The master receives from each teacher under his charge early reports as to the appearance of symptoms of illness in any pupil under his charge. These reports are given to the visiting physician, who at once examines the child and makes a record of his diagnosis and action. If the physician finds the child too ill to remain in school it is sent home for the care of parents and the family physician. Only favorable reports have been made concerning the operation of the plan. The corps of medical men serve an excellent purpose in the control of contagious diseases. The work is generally approved by the medical profession, by school teachers and by the community at large. For $10,000 a year the teachers and 70,000 school children have the benefit of well selected medical oversight.

Next came the paper from our worthy secretary, chairman of the committee on Disposal of the Dead. The report was an able and exhaustive presentation of the subject from a legal as well as from a scientific standpoint, and it will be a valuable contribution to sanitary literature. Summarized, the committee concludes:

First—Cremation is to be favored as a safe and cleanly method of disposing of the dead.

Second—Cremation in the United States, at least for many places, needs further safe-guarding to prevent concealment of crime.

Third—Earth burial under proper conditions is also a safe and satisfactory method for the disposal of the dead.

Fourth—The location, preparation and use of burial grounds should be controlled by statutes under direction of boards of health.

Fifth—Intra-mural burial should be prohibited, and a considerable space in which there should be no burials should be provided around the outer areas of cemeteries to prevent the encroachment of dwellings.

Sixth—Cemeteries should have a loose, porous soil, underdrained, and precautions should be taken to protect sources of water or ice supplies from such drainage.

Seventh—Closed vaults and indestructible receptacles or coffins for the dead should not be used, the body being permitted to return to dust as rapidly as possible.

Eighth—Separate graves, with sufficient space between them, should be required.

Ninth—No one should be permitted to dispose of a corpse without a permit from a proper authority, to be issued only after satisfactory evidence of the cause of death.

Tenth—Only licensed undertakers should be permitted to dispose of the dead, and under such restrictions as may be imposed by health authorities.

Eleventh—The body of a person who has died of a contagious disease should not be permitted in a public receiving vault. Public funerals in such cases should be prohibited, special precautions being taken to guard against the conveyance of contagion by those who have been associated with the deceased.

Next, the Disposal of Dead Bodies with especial Reference to Sanitary and Medico-legal Relations was considered in a paper by Dr. Walter Suiter, of Herkimer, New York. After reviewing the customs of embalming of the ancient Egyptians, Grecians, Romans and Chinese, the writer argues that there is too much carelessness shown in doing the work by

undertakers without legal regulation to obviate it. He said: "It is the doorway to an enormous and systematic deception, a commercial fraud as a comfortable fee is charged for the services. To illustrate take the case of General Grant. Extraordinary precautions were taken to preserve the body, but a few days later, when the remains reached Albany, the features of the distinguished man were almost unrecognizable." The danger of embalming as a means of concealing crime by poisoning was referred to and incidents cited to show that it had been done. The writer further stated that gallons of poisonous solutions are injected into bodies indiscriminately, which are in a short time absorbed by contiguous soils and are taken up by subterranean waters which receive the percolations of cemeteries, and thereby gain access to wells. For example, a recent examination of the water of a creek which flows through Forest Lawn Cemetery, Buffalo, was found to be impregnated with considerable quantities of arsenic. The writer urged a stringent law regulating embalming.

At the evening session of that day, Dr. Solly of Colorado Springs, read a very valuable paper on Influences peculiar to High Altitudes upon Sanitary Conditions. Among other things he said, the special effects of altitude are directly produced neither by reduced pressure of the atmosphere nor by a reduced amount of oxygen affecting the lungs and heart, but by the amount of oxygen pressure. When air is inhaled into the lungs a certain proportion of the total amount of oxygen contained in the air is absorbed by the hemoglobin. The following facts are established, namely: that the peculiar effects of high altitudes are to increase the amount of red corpuscles and hemoglobin and the power of blood absorption. The chest expansion is also increased. The latter is proved by the almost emphysematous character of the breathing especially at the apices of the lungs of native born children and old residents.

In conclusion several papers were read by Mexican physicians on yellow fever. Dr. Manuel Carmona Y. Valle read a paper disclosing a new discovery which is the result of fourteen years of study and experimentation. Dr. Valle is director of the National school of medicine in Mexico, and said to be a very learned gentleman. His secret consists in the hypodermic injection of urine which if practiced perfectly will stem the disease and finally eradicate it altogether. He has also inoculated persons free from the disease with the urine from a four days sufferer which thorougly immunized the person against the disease. He claims it acts similarly to vaccination in small-pox. He injects the fluid into the back part of the arm and claims that abscesses are rare as a result of the inoculation. He has performed hundreds of inoculations with uniformly good results and his mode of treatment is now being used by Dr. Garciadel Lomel in Panama with wonderful success.

ANNUAL REPORTS

OF

LOCAL BOARDS OF HEALTH

FOR THE

YEAR ENDING DECEMBER 31, 1895.

OHIO STATE BOARD OF HEALTH,

OFFICE OF THE SECRETARY,

COLUMBUS, OHIO, *December*, 1895.

To the Health Officer:

Section 2136 of the Revised Statutes of Ohio makes it the duty of the board of health to make a report to the State Board of Health on or before the first Monday in March of each year; also to make such special reports as may be called for by said State Board.

It is more desirable in many ways that the annual reports should be made for the calendar year, and this is necessary in order that these reports may be published in the annual reports of the State Board of Health; you are therefore respectfully requested to send your annual report as soon as possible after December 31, 1895.

Information in regard to subjects mentioned below is specially desired, but other useful information with special reference to sanitary matters in your community, will be gladly received.

An addressed envelope is enclosed for your reply.

Very respectfully,

C. O. PROBST, M. D., *Secretary.*

QUESTIONS.

1. What, in your opinion, are the chief sanitary defects in your city or village?

2. What reasons exist for permitting these sanitary defects, if any, to remain?

3. Has your board held monthly meetings, as required by law?

4. If any difficulties have arisen between the board of health and council, please state the nature of the trouble.

5. Have you any suggestions to make as to legislative changes that would tend to increase the efficiency of boards of health?

6. Do you allow within corporate limits—

   (*a*) Hog pens?

   (*b*) Slaughter-houses?

   (*c*) Dairies?

7. Do you examine milk supplies and inspect dairy stables, and cows furnishing milk to your citizens?

8. Do you require dairymen to obtain permits to sell milk?

9. Please give the number of cases and deaths reported during the year from contagious diseases.

Remarks.

ANNUAL REPORTS.

ADA—W. H. MORROW, H. O.

Population 2,500.

1. Lack of water works and more sewerage.

2. The heavy bonded indebtedness of our village.

3. No The board of health impowers the health officer with full executive power and they meet on the call of the president.

4. None.

5. No.

6. (a) Yes where they are not offensive to neighbors.
(b) No.
(c) No.

7. No.

8. No.

9. Diphtheria, 6 cases; scarlet fever, 5 cases; typhoid fever, 5 cases, 1 death.

ALLIANCE—Dr J. A. ROACH, H. O

Population 8,000.

1. Sanitary sewers not yet complete.

2. (No answer.)

3. Yes.

4. None.

5. (No answer.)

6. (a) No.
(b) No.
(c) No.

7. Yes.

8. Yes.

9. Scarlet fever, 4 cases; typhoid fever, 4 deaths: measles, 1 case.

AMELIA—Dr. W. B. DOAN, H. O.

Population 400.

1. There are none.

2. (No answer.)

3. No.

4. (No answer.)

5. (No answer.)

6. (No answer.)

7. We have no dairy stables in the village.

8. No.

9. Typhoid fever, 1 death.

ANNA—DR. C. W. B. HARBOUR, H O.

Population 900.

1. Water supply owing to the quick sand in this locality, the wells with a few exceptions are but 12 to 18 feet, being old wells and dug. But the new or late sunk wells are drilled 70 to 80 feet.

2 We are now drilling for oil or gas and if a good water well is produced will be used by the town.

3. No.

4. None.

5. No.

6. (a) Yes, but closely inspected.
(b) No.
(c) Yes. Creamery and cheese inspected.

7. No dairy stables, milk from farms.

8. No.

9. Typhoid fever, 2 cases.

ARCANUM—D. J. ROBBINS, H. O.

Population 1,500.

1. (No answer.)

2. (No answer.)

3. No.

4. None.

5. None.

6. (a) Yes.
(b) Yes.
(c) There are none.

7. No.

8. No.

9. Typhoid fever, 5 cases.

ARCHBOLD—AUGUST RUIHLEY, H. O.

Population 850.

1. Main sewer emptying in open ditch in the heart of the town Too much live stock kept by town people. Lack of proper privy vaults. Lack of drove wells.

2. Council and board of health are afraid that it would make an extra tax. Lack of æsthetic principles in citizens.

3. No.

4. (No answer.)

5. Members elected by the people. Compulsory records of births and deaths and contagious diseases.

6. (a) Yes.

(b) No.

(c) Yes.

7. No.

8. No.

9. Typhoid fever, 4 cases.

REMARKS: There are about from 80 to 100 cows kept within corporate limits; 80 to 50 horses.

ARLINGTON—J. S. ECCLESTON, H. O.

Population 700.

1. Impure water.

2. No particular reason.

3. Yes.

4. No.

5. (No answer.)

6. (a) Yes, but generally kept clean.

(b) Yes.

(c) No.

7. No.

8. No.

9. Typhoid fever, 2 cases; measles, 3 cases.

ASHLEY—DR. H. N. COOMER, H. O.

Population 700.

1. Overflowing privy vaults, hog pens, a stock-yard where sheep are kept awaiting cars for transportation, also a creamery where the refuse products cause an intolerable stench in warm weather.

2. There is no reason why they are suffered to remain.

3. No.

4. No difficulties in particular.

5. All seem willing to try the laws as they are and if a failure should occur in trying to enforce them, we will ask for something better.

6. (a) They are an abominable nuisance and must be banished.

(b) There are none within corporate limits.

(c) One dairy or creamery mentioned in answer to question 1.

7. The creamery is supplied from the surrounding country, and inspected by the proprietors of the concern.

8. (No answer.)

9. Diphtheria, 1 case; typhoid fever, 7 cases.

ASHVILLE—JOHN J. JOHNSON, H. O.

Population 700.

1. We have our village in good sanitary condition.

2. (No answer.)

3. Only when special business demands.

4. Not in any way. The council is always ready to assist the board of health to enforce their rules.

5. (No answer.)

6. (a) Have a few, but have to regulate them often.

(b) No.

(c) No.

7. No action taken on the milk supply.

8. No.

9. None.

ATHENS—Dr. W. N. ALDERMAN, H. O.

Population 3,000.

1. Depositing garbage on the streets and alleys and proper surface drainage.

2. Lack of interest on the part of the citizens.

3. No.

4. None.

5. (No answer.)

6. (a) Yes but not within 200 feet of residence or business house.

(b) No.

(c) No.

7. No.

8. (No answer.)

9. Scarlet fever, 1 case; typhoid fever, 8 cases, 1 death.

REMARKS: Two of the cases of typhoid fever contracted the disease out of Athens. The remaining six cases used well water. No cases occurring where hydrant water was used. We hope our sewerage system put in the past season will be of great value to the town.

BAINBRIDGE—Dr. R. H. MCKEE, H. O.

Population 1,000.

1. Hog pens and imperfectly constructed privy vaults.

2. The majority of the people favor the hog and the law in regard to constructing privy vaults has not been enforced.

2. No; only when called together by emergency.

4. None.

5. Drive the hog out of corporation.

6. (a) Yes.

(b) No.

(c) Yes.

7. No.

8. No.

9. Diphtheria, 4 cases.

BARNESVILLE—Dr. D. H. CRAWFORD, H. O.

Population 3,500.

1. Keeping of hogs inside of corporation.

2. No reason and I shall do what I can to put them out.

3. They have.

4. Council thinks it has the right if necessary to cut bills after being certified by board of health.

5. I have none.

6. (a) Yes.

(b) No.

(c) Yes.

7. Inspect the stables only.

8. No.

9. Diptheria, 3 cases; scarlet fever, 24 cases.

BEACH CITY—E. W. SPIDELL, H. O.

Population 500.

1. The keeping of hogs within the corporation limits.

2. (No answer.)

3. No; nothing demanded it.

4. None.

5. None.

6. (a) Yes.

(b) No.

(c) (No answer.)

7. Do not. We have no dairies. Nearly every citizen has his own cow.

8. (No answer.)

9. Measles, 28 cases.

REMARKS: Beach City had but five deaths during the year, and none of them from contagious diseases. We are now having an epidemic of measles, but in a mild form. So far there have been no deaths. We thought it best to stop the schools and Sunday schools.

BEDFORD—CHAS. W. KERSLAKE, H. O.

Population 1,400.

1. A small creek running through the village

2. No funds to pay for sewering.

3. No. The village is in a good sanitary condition and no use of it.

4. None.

5. None.

6. (a) Yes.

(b) None.

(c) Yes.

7. No.

8. No.

9. (No answer).

BELLAIRE—DR. D. W. LONG, H. O.

Population 10,000.

1. A proper method of disposing of garbage and night soil. The Ohio river has formerly been used but council stopped that, but made no other provision. There are also some few places that need sewering.

2. Lack of funds; also lack of proper knowledge on the great need of the above.

3. No, not always monthly.

4. There have been no difficulties of importance, though I have felt the council do not fully appreciate the need of such a board.

5. Legislation that would make vaccination compulsory. Also that State Board pass all quarantines by request of local boards.

6. (a) Yes.

(b) Yes.

(c) There are none, but not because not allowed.

7. No.

8. No.

9. Diptheria, 15 cases, 5 deaths; scarlet fever, 37 cases, 3 deaths; typhoid fever, 44 cases, 11 deaths.

BELLBROOK—GEO. E. SOWARD, H. O.

Population 350.

1. Hog pens, manure piles, neglect on the part of citizens to keep privies in good condition.

2. Ignorance of the laws on the part of the citizens; they talk and act as though they believed the board of health to be usurpers.

3. We have not. The called meetings we had would average a meeting each month.

4. (No answer)

5. (No answer.)

6. (a) Yes.
   (b) No.
   (c) Yes.

7. We do not.

8. We do not.

9. (No answer.)

BELLE CENTRE—J. H. HIGHLAND, H. O.

Population 1,800.

1. Deficient drainage.

2. The defects are that we have not a sufficient fall until the river is lowered and widened.

3. No.

4. None.

5. No.

6. (a) Yes.
   (b) Yes.
   (c) Yes

7. No.

8. No.

9. Typhoid fever, 7 cases, 1 death.

BELLEFONTAINE—DR. C. W. HEFFNER, H. O.

Population 6,500.

1. Want of sewage system. A system to get rid of the privy vault nuisance.

2. Want of money to build the system.

3. Since July 1, 1895, yes.

4. None at all.

5. To give boards absolute control of sanitary fund, and where the owner can not be found or will not obey notice to require less work and delay before being able to remove or abate nuisance and charge to property.

6. (a) Yes, as long as they do not annoy any one. We have not over 12 in the town.

   (b) Yes, one, very little used and kept clean.

   (c) No.

7. If there seems to be a necessity, yes; if not, no. Dairies are from 1 to 2½ miles from town and well located.

8. Yes.

9. Diphtheria, 1 case; scarlet fever, 25 cases; typhoid fever, 25 cases; whooping cough, 18 cases.

REMARKS: We have done very well this last half of 1895. Have made quite a deal of progress toward ridding ourselves of a very bad nuisance, the Possum run nuisance. I think that next summer we will be rid of it and other nuisances. Sewerage is now a necessity and by and by we will get it.

BELLEVUE—W. H. FENN, H. O.

Population 4,000.

1. Poor drainage.

2. No good outlets for the waste-water which accumulates.

3. I dont know.

4. Dont know of any.

5. Not at this time.

6. (a) Yes.
   (b) Yes.
   (c) Yes.

7. Have not as yet.

8. Could not say as to that.

9. (No answer.)

REMARKS: I have no means of securing this information. Have been health officer but a short time.

BELLVILLE—DR. W. M. RIDENOUR, H. O.

Population 1,200.

1. Privy vaults which have been inspected and are being put in sanitary condition.

2. (No answer.)

3. Yes.

4. (No answer.)

5. (No answer.)

6. (a) No.
   (b) No.
   (c) No.

7. No.

8. No.

9. (No answer.)

REMARKS: Board was organized in September. Since then there have been no cases of infectious diseases.

BELMONT—DAVID S. SIERCE, H. O.

Population 400.

1. (No answer.)

2. (No answer.)

3. No.

4. Have been none.

5. (No answer.)

6. (a) Yes.
   (b) No
   (c)

7. No.

8. No.

9. Scarlet fever, 4 cases; typhoid fever, 2 cases.

BERNE—Dr. G. G. Mallett, H. O.

Population 1,000.

1. Privy vaults.

2. The board is a little timid fearing trouble and expense of law suits.

3. No.

4. None.

5. None.

6. (a) Yes.
(b) None.
(c) None.

7. Most citizens that use milk keep a cow.

8. No.

9. Diphtheria, 2 cases; typhoid fever, 1 case.

BETTSVILLE—A. Bollinger, H. O.

Population 650.

1. Privy vaults; we try to keep them as clean as possible.

2. (No answer.)

3. Not regularly.

4. It seems as though the village council wants too much done, and don't want to allow the clerk and health officer anything.

5. There ought to be some compensation allowed to clerk and health officer.

6. (a) Yes, but they have to keep pens very clean.
(b) Yes, but we have ordered them out.
(c) Have none; milk sold by private families.

7. We haven't yet.

8. We have no dairy.

9. Typhoid fever, 2 cases, 1 death.

Remarks: Health board organized July 22, 1895. Since the board has been organized everything has been kept as well as could be expected.

BLAKE MILLS—W. F. Reidenbach, H. O.

Population 400.

1. Slaughter-houses; eight hog pens.

2. For want of action of corporation.

3. One each month.

4. (No answer.)

5. (No answer.)

6. (a) Yes.
(b) Yes.
(c) (No answer.)

7. No.

8. (No answer.)

9. Typhoid fever, 10 cases, 2 deaths; measles, 18 cases.

BLANCHESTER—Dr. S. B. Judkins, H. O.

Population 2,000.

1. Our village is badly in need of water for all purposes. The wells are surface, and impure water is the rule. All wells were dry the past summer. The best and a great portion of our town was destroyed by fire October 18, 1895. We need water works badly.

2. Our council thinks it will cost too much to put in water works.

3. No.

4. Nothing of a serious nature.

5. I think it would be just as well to do away with local boards and have only a health officer, and all rules and regulations should be issued by the State Board of Health. The local health officer could recommend any special rule to State Board for local adoption.

6. (a) Conditionally, if the neighbors do not complain.
(b) We have a slaughter-house on the outskirts; it is kept clean.
(c) None in corporation.

7. No; we contemplate inspection of milk and dairy stables in the near future. Our milk supply is very nice, and have not heard any complaint.

8. No.

9. Typhoid fever, 2 cases, 2 deaths.

Remarks: We have not had diphtheria since the public school building was disinfected with a solution of bi-chloride of mercury three years ago.

BLOOMINGBURG—L. Dellinger, H. O.

Population 750.

1. Low water in some wells.

2. (No answer)

3. Yes.

4. None.

5. None.

6. (a) Yes, if in good condition.
(b) None.
(c) None.

7. No.

8. (No answer.)

9. Typhoid fever, 10 cases, 1 death.

BOWLING GREEN—A. ORDWAY, H. O.

Population 5,000.

1. In my opinion we need a thorough system of sewerage. Our sewerage is very bad.

2. We know of no reason why we should not have a good system of sewerage.

3. They have.

4. We have had no trouble.

5. If our council would legislate for a better system of sewers, it would help the board of health very much.

6. (a) We do.

(b) Yes.

(c) Yes.

7. As yet our board has not required it.

8. We do not.

9. Diphtheria, 2 cases, 1 death; scarlet fever, 26 cases; typhoid fever, 12 cases, 4 deaths; measles, 2 cases.

REMARKS: We think that we could have the scarlet fever stamped out if our doctors would report them promptly. We have one doctor that will not report.

BRADNER—PETER PLANTZ, H. O.

Population 1,200.

1. Drainage.

2. No outlet for sewerage and no money to make one.

3. No, only two since last spring.

4. None.

5. (No answer.)

6. (a) We have two or three.

(b) One.

(c) None.

7. Yes.

8. Yes.

9. Scarlet fever, 1 case; typhoid fever, 4 cases. 2 deaths.

REMARKS: Whooping cough epidemic, but no reports have been made to board of health, so I am unable to give statistics.

BROUGHTON—J. K. SIERER, H. O.

Population 400.

1. (No answer.)

2. (No answer.)

3. No. It is next to impossible to get the members of the board to attend.

4. (No answer.)

5. (No answer.)

6. (a) There is no ordinance to the contrary.

(b) (No answer.)

(c) (No answer.)

7. (No answer.)

8. No.

9. We have none of the above cases to report.

BRYAN—NICHOLAS VINEYARD, H. O.

Population 4,000.

1. Want of ample sewerage. The principal streets are very well tiled with a 12-inch tile, but not equal to large sewerage.

2. The geographical location of Bryan is such that it would require vast outlay financially to construct ample sewerage.

3. Respond promptly when called for business.

4. No cause of trouble. Both bodies work in perfect harmony. All board of health bills promptly met and paid by the council without a murmur.

5. (No answer.)

6. (a) Yes, under strict ordinance provisions.

(b) None within city limits.

(c) Three good dairies on outside of city.

7. I have closely examined the cows, stables, stalls, feed, water, milk-house, vessels, delivery wagons and cans; all are in first class condition.

8. I think not.

9. Typhoid fever, 1 case, 1 death.

BUCYRUS—Dr. W. A. DAUGHERTY, H. O.

Population 7,000.

1. Sewerage good, but same is deposited into river near center of city that has not sufficient flow during summer months to carry same away.

2. Because our efforts with our city council to build an intercepting sewer have so far failed.

3. They have.

4. (No answer.)

5. (No answer.)

6. (a) Yes.

(b) Yes.

(c) Yes.

7. Yes.

8. Do not.

9. Diphtheria, 10 cases, 2 deaths; scarlet fever, 5 cases; typhoid fever, 45 cases, 4 deaths; measles in families, 130 cases; whooping cough, 10 cases.

BYESVILLE—O. T. BARNETT, H. O.

Population 1,150.

1. Open ditches, hog pens and privies.

2. For want of money on ditches and privies. Hog pens are permitted on account of the poor.

3. No.

4. No trouble at present.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) No.

7. No.

8. No.

9. There have been no cases reported by physicians.

CADIZ—MRS. M. J. LYONS, M. D, H. O.

Population 2,000.

1. Privy vaults, pig pens and contaminated water. Also defective drainage. More vaults were emptied last summer than ever before, by the enterprise of some parties who came here for that purpose.

2. The subject of hog pens has been discussed by our board, but not ruled out; arguments in favor of the poor preventing. A mistaken kindness.

3. No.

4. None.

5. A few active members added to the board of health. We have not the required number. However, this is the duty of council, not legislative.

6. (a) Yes.
(b) Yes; or very near corporate limits.
(c) None.

7. No.

8. (No answer.)

9. (No answer.)

CAMBRIDGE—I. A. OLDHAM, H. O.

Population 7,000.

1. Have neither water nor sewerage system.

2. The city is preparing to build water works

3. Not regular, but nearly so.

4. There has been co-operation between the board and council.

5. Have not been in position long enough to know the wants or if any exist.

6. (a) Yes.
(b) No.
(c) Yes.

7. No. Will recommend to the board at its next meeting to provide for same.

8. No.

9. Diphtheria, 1 case; scarlet fever, 19 cases; typhoid fever, 3 cases.

CAMDEN—JOHN WHITTAKER, H. O.

Population 1,000.

1. I know of no sanitary defects other than the privy vaults. We have a gravel subsoil, and the drainage is good. The streets and alleys are kept clean and free from garbage and offal, and if we had some system to prevent the percolation of the contents of vaults through the soil, our condition would be good.

2. (No answer.)

3. No.

4. (No answer.)

5. (No answer.)

6. (a) Yes.
(b) Yes, one.
(c) None.

7. No.

8. No.

9. Scarlet fever, 11 cases; typhoid fever, 7 cases.

REMARKS: There are no large dairies in or near here. Many families keep a cow and the farmers who supply milk to the town keep but a small number of cows. We discussed the matter of allowing hog pens in town at our last meeting and concluded it would be better for us to regulate the condition of the pens than to attempt to exclude them altogether. The slaughter-house is on the outside of the village and kept in good condition.

CANAL FULTON—GEORGE BECKER, H. O.

Population 1,200.

1. (No answer.)

2. (No answer.)

3. No.

4. There is none.

5. None.

6. (a) Yes, in good shape.
(b) No.
(c) No.

7. Yes.

8. No.

9. Typhoid fever, 2 cases.

CANAL WINCHESTER—Dr. W. S. Gayman, H. O.

Population 800.

1. Open ditch extending through the town. The low stage of water in canal during summer months.

2. (No answer.)

3. Yes.

4. None.

5. (No answer.)

6. (a) Yes.

(b) Yes.

(c) No.

7. No.

8. (No answer.)

9. (No answer)

CANFIELD—A. D. Wood, H. O.

Population 675.

1. (No answer.)

2. (No answer.)

3. No.

4. None as yet.

5. (No answer.)

6. (a) Yes.

(b) None.

(c) None.

7. Do not.

8. No.

9. Scarlet fever, 12 cases, 1 death; typhoid fever, 2 cases, 1 death; measles, 5 cases.

Remarks: Sanitary condition of village is considered good.

CANNELVILLE (DILLON P. O.)—Dr. G. B. Trout, H. O.

Population 150.

1. A few privy vaults that should be changed.

2. Lack of enforcement.

3. No.

4. (No answer.)

5. (No answer.)

6. (a) Yes.

(b) No.

(c) No.

7. No.

8. No.

9. Scarlet fever, 1 case; typhoid fever, 1 case; whooping cough, 15 cases.

CARTHAGE—Harry Ross, H. O.

Population 2,500.

1. The village is in a splendid sanitary condition with the exception of sewerage, which is much needed.

2. The village is overburdened with taxation now and it is impossible to get such an act through.

3. Yes.

4. The council of this village has been more than kind to the health board in every respec since the organization of said board.

5. So far as I can see, the laws are almost perfect.

6 (a) Yes, but they must be at a distance of 200 feet from any dwelling.

(b) No.

(c) Yes.

7. We inspect stable and stock only.

8. No.

9. Scarlet fever, 2 cases; measles, 39 cases; whooping cough, 10 cases.

CATAWBA—Dr. F. D. Beach, H. O.

Population 300.

1. Natural drainage is excellent. No especial sanitation but cleanliness.

2. (No answer.)

3 Have not had quorum at every meeting night.

4. (No answer.)

5. (No answer.)

6. (a) Yes, very few and in retired places.

(b) No.

(c) No.

7. (No answer.)

8. (No answer.)

9 Measles, 2 cases; whooping cough, few cases.

Remarks: We have had a very healthy year

CEDARVILLE—Al. Cline, H. O.

Population 2,000.

1. (No answer.)

2. (No answer.)

3. Yes.

4. There has been no trouble between the board of health and council.

5. (No answer.)

6. (a) According to State law we do.

(b) No.

(c) No.

7. Yes, we do.

8. Yes.

9. Diphtheria, 2 cases; scarlet fever, 5 cases; typhoid fever, 25 cases, 3 deaths.

CHAGRIN FALLS—J. H. ISAAC, H. O.

Population 1,900.

1. Sewage.

2. Lack of push.

3. No.

4. (No answer.)

5. No.

6. (a) A few.

(b) No.

(c) No.

7. No.

8. We never have.

9. Diphtheria, 1 case; scarlet fever, 4 cases; typhoid fever, 25 cases, 3 deaths.

CHICAGO—Dr. D. H. YOUNG, H. O.

Population 2,700.

1. Surface pollution from lack of sewage. We have no sewers only open ditches, but we have a hard clay soil that water does not penetrate and the surface is washed when it rains. Most of the filth goes into a large reservoir used by the railroad company for steam purposes.

2. Lack of means and not enough valuation to raise the tax, the town being a new one.

3. Yes.

4. (No answer.)

5. None.

6. (a) Not during the warm months.

(b) No.

(c) There are none.

7. Yes.

8. None.

9. Scarlet fever, 1 case; typhoid fever, 1 case; whooping cough, 20 cases.

CHILLICOTHE—DR. C. S. MCCAFFERTY, H. O.

Population 12,000.

1. Deficient sewerage.

2. None. Council preparing to sewer more.

3. Yes.

4. None whatever so far as I know.

5. Yes; have it that cities of the second class and third grade shall have an M. D. as health officer. Make it mandatory.

6. (a) No.

(b) Yes; under restrictions.

(c) Yes; under restrictions.

7. Yes.

8. Yes.

9. Diphtheria, 2 cases, 1 death; Scarlet fever, 18 cases; typhoid fever, 43 cases, 15 deaths.

REMARKS: This report above is the very best I could do, and represents only since June 24, 1895, as far back as I could find any reports of the ex-health officer or clerk.

CIRCLEVILLE—W. F. TOLBERT, H. O.

Population 7,000.

1. Lack of sewerage.

2. Want of funds to build them.

3. Yes.

4. None last year.

5. (No answer.)

6. (a) Yes.

(b) Yes.

(c) Yes.

7. Do not, but have good stock in our dairies; good healthy cows.

8. No.

9. Diphtheria, 3 cases, 1 death; scarlet fever, 17 cases, 3 deaths; typhoid fever, 25 cases, 6 deaths; whooping cough, 3 deaths.

REMARKS: We have had a great many cases of whooping cough that were not reported to my office; the same with typhoid fever. As we do not card houses for these diseases, we can not get them accurate.

CLEARPORT—Dr. JAS. T. HUFFORD, H. O.

Population 50.

1. The cemetery is just north and on higher ground, sandy, porous soil, and not over a hundred yards from graves to nearest dwelling house and well.

2. Lack of interest or sanitary knowledge at the time the cemetery was located.

3. No; only as called.

4. (No answer.)

5. (No answer.)

6. (a) (No answer.)

(b) (No answer.)

(c) (No answer.)

7. The people furnish their own milk and keep but a few cows together.

8. (No answer.)

9. (No answer.)

COMMERCIAL POINT—W. A. SMITH, H. O.

Population 450.

1. Carelessness of the people generally.

2. (No answer)

3. It has.

4. None.

5. None.

6. (a) Yes.

(b) No.

(c) None.

7. We have no dairies.

8. (No answer.)

9. Scarlet fever, 10 cases, 1 death; typhoid fever, 1 case, 1 death; measles, 30 cases, 1 death; whooping cough, 3 cases.

CONNEAUT—DR. D. S. CASSITT, H. O.

Population 5,000

1. Disposal of garbage and waste water from kitchens. Open drains and barrels buried, into which sinks are drained. Defective plumbing. Difficulty of properly disposing of night soil and rubbish. Sewer system is incomplete.

2. We expect to erect a Dixon crematory during the year which will remove a great many present difficulties.

3. Yes, and a number of special meetings.

4. We have had no trouble. Everything harmonious between board of health and council.

5. Have no suggestions to offer at present time.

6. (a) No.

(b) No.

(c) There are no dairies in the village.

7. The board made an examination of milk supplies during 1895. But as I was not in office at that time do not know results. Stables and cows have not been inspected to my knowledge.

8. We do not.

9. Scarlet fever, 1 case; typhoid fever, 18 cases, 3 deaths; measles, 211 cases, 4 deaths; whooping cough, 19 cases.

REMARKS: A general resume of improvements in sanitary conditions of Conneaut for 1895. All nuisances brought to the attention of the board of health have been removed on order of board complied with in part at least. All privies in fire district have been ordered removed or connections made with sewer; all but one or two parties have complied. About 900 feet of sewer laid at Conneaut Harbor and connections made with all properties on sewer, with one or two exceptions.

CONVOY—DR. R. L. CROOKS, H. O.

Population 750.

1. Bad wells, dirty pig pens, refuse of barns thrown in alleys.

2. Carelessness and negligence.

3. No.

4. None.

5. The mayor to take more interest.

6. (a) Yes.

(b) No.

(c) No.

7. No.

8. No.

9. Scarlet fever, 4 cases; typhoid fever, 6 cases, 2 deaths.

COPLEY—O. E. ARNOLD, H. O.

Population 200.

1. The need of good water, which, by little trouble, can be obtained.

2. Expense and negligence.

3. They have not.

4. After we organized our board from the council, an order came from State Board stating the council could not be members, and since I could do nothing or get them together.

5. The electing of good members as a board is about all I can suggest at present.

6. (a) If kept in good order.

(b) If kept in good order.

(c) If kept in good order.

7. No; the milk is inspected at Akron, as that is the market.

8. The board at Akron governs that.

9. (No answer.)

COSHOCTON—HOLDER BLACKMAN, H. O.

Population 5,000.

1. (a) Want of a system of sewerage.

(b) No way of destroying garbage and waste material.

(c) No way of cremating dead animals.

(d) Scavengers should be employed to remove regularly night soil under supervision and regulations of the board of health.

2. Non-action of the board. Need of money. Council disagreeing as to details, withholds funds from board to carry out plans proposed to correct defects mentioned.

3. The board has not met monthly. The explanation given is, all is being done by health officer that can be done with limited means at board's command. Besides that, the sanitary condition of the city is most satisfactory.

4. There are no antagonisms between the council and the board of health, but council refuses to incur greater expenses required to carry on the needed work, and disagrees as to what and how it should be done.

5. In my judgment, boards of health have ample power, but not enough funds to use power already possessed.

6. (a) No; except in outskirts of town.

(b) Yes; two are within corporate limits, though regulated by section 29.

(c) No.

7. No; we have no suspicion even of impure milk being sold in corporate limits.

8. No; our supply of milk is so good no need has been felt of regulating it.

9. Diphtheria, 9 cases, 3 deaths; scarlet fever, 78 cases, 3 deaths; typhoid fever, 15 cases, 2 deaths; measles, 49 cases; membranous croup, 3 cases, 4 deaths.

COVINGTON—GEORGE FLAMMER, H. O.

Population 1,800.

1. Hog pens and water closets.

2. In the first place, the board of health is not unanimously in favor of legislating against keeping hogs in the village. Second, the people are opposed to both the above measures.

3. No.

4. No trouble to my knowledge.

5. A law authorizing village councils to pay members of board of health at least one dollar each for every regular meeting and call meetings fifty cents, and village health officer not less than ten dollars per month.

6. (a) Yes.
(b) Yes.
(c) Are located in the country districts.

7. No.

8. No.

9. Typhoid fever, 2 cases.

CROOKSVILLE—W. C. YOUNG, H O.

Population 800.

1. The drainage is not sufficient.

2. The place has been incorporated but a short time. The officers are now looking into the matter of having the place in a better shape next year.

3. Only part of the time.

4. None.

5. I do not know of any.

6. (a) Yes.
(b) Have none.
(c) Have none now.

7. (No answer.)

8. Have no dairymen.

9. We have had no infectious diseases.

CUMBERLAND—G. E. MCENDREE, H. O.

Population 600.

1. Have none.

2. None.

3. Have not.

4. None.

5. None.

6. (a) Yes.
(b) Yes through winter.
(c) None.

7. No.

8. No.

9. Typhoid fever, 6 cases, 1 death.

CUYAHOGA FALLS—I. N. REID, H. O.

Population 3,500.

1. The want of sewerage.

2. A want of, on the part of our city council, to see the need thereof.

3. No.

4. Not any.

5. I have none so far as the health of our village is concerned.

6. (a) Yes, on the outskirts.
(b) Yes, on the outskirts.
(c) Yes.

7. No.

8. No.

9. Typhoid fever, 1 case, 1 death; whooping cough, 7 cases.

CYGNET—JAS. H. FERGUSON, H. O.

Population 800.

1. Defective sewer system; neglected privy vaults; poor water.

2. Lack of energy on the part of the board of health, and a lack of knowledge in regard to sanitary effects on public health.

3. No.

4. None.

5. That the proceedings necessary to enforce rules be more simple, and that boards have full jurisdiction over their districts.

6. (a) Yes.
(b) None.
(c) None.

7. No.

8. (No answer.)

9. Typhoid fever, 5 cases; measles, 20 cases; whooping cough, 20 cases.

REMARKS: I think that if health officers were paid a salary for the abuse they have to take on account of ignorance, it would help a great deal. That a larger appropriation be allowed the State Board of Health. That members of boards of health be compelled to meet according to law, as without them a health officer is of no good, no matter how much he tries to do his duty.

DAYTON—DR. A. H. IDDINGS, H. O.

Population 85,000.

1. Open vaults, open and surface wells Have passed a resolution to require all wells to be driven 45 feet deep which will be enforced during spring and summer.

2. Nothing save the expense of changing. A change will be forced.

3. Yes.

4. Insufficient appropriation for sanitary purposes.

5. The passage of a law authorizing boards of health to make their own assessment for sanitary expenses.

6. (a) Yes.
(b) Yes.
(c) Yes.

7. Yes, only to a limited extent because of a want of a sufficient force of men to do the work.

8. No.

9. Diphtheria, 126 cases, 21 deaths; scarlet fever, 95 cases, 2 deaths; typhoid fever, 292 cases, 38 deaths.

DEFIANCE—DR. P. H. ALDRICH, H. O.

Population 10,000.

1. The outlets of our main sewers are too near the shore, in low water they empty on dry ground.

2. Sewer committee do not act.

3. Yes.

4. None.

5. (No answer.)

6. (a) Where I consider them safe.
(b) One poultry.
(c) None inside the city.

7. Yes.

8. No.

9. Diphtheria, 2 cases, 1 death: scarlet fever, 31 cases, 2 deaths; typhoid fever, 25 cases, 4 deaths: measles, 25 cases.

DEGRAFF—DR L. D. CRAIG, H. O.

1. Privy vaults (not water tight) dug nearly to the same layer of sand and gravel and in proximity to shallow wells from which a large portion of the water supply is taken. Hog pens.

2. Inadequate provisions of the local sanitary regulations, against such, and a lack of full enforcement of the existing laws in the past.

3. Yes.

4. None.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) No.

7. No.

8. No.

9. Scarlet fever, 4 cases.

DELAWARE—DR. L. S. LUPTON, H. O.

Population 9,000

1. Lack of a system of general sewerage.

2. Poverty and apathy.

3. Yes.

4. None have arisen.

5. No.

6. (a) Yes.
(b) Yes.
(c) Yes.

7. No.

8. No.

9. Diphtheria, 6 cases, 3 deaths; scarlet fever, 5 cases, 3 deaths; typhoid fever, 56 cases, 4 deaths; measles, 8 cases; Whooping cough, 1 case, 1 death.

DELPHOS—DR. J. M. MARSH, H. O.

Population 5,000.

1. Privy vaults improperly constructed.

2. The danger from this source will soon be overcome to a certain extent by the introductio of a system of water works.

3. Have held meetings at call of health office

4. There has been none recently.

5. None.

6. (a) Yes, by complying with an ordinance regulating their construction and sanitary condition.

(b) No.

(c) No.

7. I have on one or two occasions.

8. No.

9. Diphtheria, 1 case, 1 death; typhoid fever, 10 cases, 2 deaths.

REMARKS: Our village is in quite good sanitary condition but will be improved very much soon by the introduction of a water works system and by the introduction of a more complete system of sewerage.

DELTA—DR. WILLIAM RAMSEY, H. O.

Population 1,600.

1. None that we know of. In the early part of the fall we had a few deaths from diphtheria attributable to bad management in the closet (Smeed's system), which has been corrected. We are free from every and anything indicative of contagion. Health is remarkably good.

2. (No answer.)

3. Yes, except in times of good health.

4. No.

5. Not any.

6. (a) Only a few and they are isolated.

(b) No.

(c) No.

7. It has never been done.

8. No.

9. Diphtheria, 12 cases, 4 deaths; typhoid fever, 1 case, 1 death.

REMARKS: We think the health of our town is not surpassed by any in the State. We attribute it largely to good water. Our wells are largely artesian. Our sanitary arrangements are good.

DOYLESTOWN—DR. A. E. STEPFIELD, H. O.

Population 1,200.

1. Hog pens. Poor sewerage.

2. Public sentiment is against removal of hog pens.

3. No.

4. None.

5. Requirements for attendance by at least one representative of the board of health and provision for expense of the same.

6. (a) Yes.

(b) No.

(c) Cows are kept for private use.

7. No.

8. No.

9. Typhoid fever, 3 cases, 1 death; measles, 40 cases.

DUBLIN—Dr. R. M. MERRYMAN, H. O.

Population 300.

1. Have none.

2. (No answer.)

3. No.

4. (No answer.)

5. (No answer.)

6. (a) No.

(b) No.

(c) No.

7. (No answer.)

8. We have none.

9. Scarlet fever, 5 cases.

EAST PALESTINE—W. H. OLLOMAN, H. O.

Population 2,000.

1. A system of sewerage.

2. Our people are not ready to bond the village for that purpose.

3. Not altogether.

4. None whatever.

5. No.

6. (a) Yes.

(b) No.

(c) One.

7. No.

8. No.

9. Diptheria, 1 case; scarlet fever, 4 cases; typhoid fever, 1 case.

EDGERTON—DR. CALVIN HATHAWAY, H. O.

Population 1,500.

1. The St. Joseph river runs along the side of the town and we drain into it. Diphtheria appears to be epidemic here.

2. (No answer.)

3. No.

4. None.

5. None.

6. (a) Yes, 100 feet from dwellings.

(b) No.

(c) No.

7. No.

8. Have no dairy.

9. Diphtheria, 4 cases, 2 deaths; measles, 100 cases; whooping cough, 125 cases.

ELDORADO—Dr. J. A. DAVISSON, H. O.

Population 500.

1. The most dangerous of sanitary defects in all villages are the holes in the ground under privys that are not cemented.

2. The lack of knowledge on sanitary questions even by members of health board.

3. When there is anything to do.

4. None.

5. I think there shou'd be a state law and not local ordinances to regulate some of the most general nuisances, such as privies, pig pens, etc.

6. (a) Yes.

(b) No.

(c) Yes.

7. No.

8. No.

9. Typhoid fever, 1 case, 1 death.

ELMORE—DR. S. T. DROMGOLD, H. O.

Population 1,200.

1. I believe our sanitary condition is equal to any village in the State. It is watched carefully.

2. (No answer.)

3. Yes.

4. Everything is and has been congenial.

5. None.

6. (a) Yes.

(b) No.

(c) No; only private families with a cow.

7. No.

8. No.

9. Whooping cough, 5 cases.

REMARKS: We allow hog pens in our village, but require strict adherence to the sanitary laws and they are in each and every particular lived up to. I have not heard any complaint in the last year.

ELMWOOD PLACE—JOHN H. BART, H. O.

Population 2,800.

1. Old vaults built before new law, (making same water tight), was passed.

2. (No answer.)

3. Yes.

4. Council has refused payment of bill contracted by board of health for cleaning a pike (Carthage pike), same having been condemned as a nuisance by board of health council claiming that said pike belonged to Hamilton county and board of health had no jurisdiction over same.

5. None.

6. (a) Yes.

(b) Have none.

(c) Have none.

7. No.

8. Yes.

9. Diphtheria, 6 cases; scarlet fever, 5 cases; typhoid fever, 1 case, 1 death; measles, 24 cases.

ENON—DR. ELWOOD MILLER, H. O.

Population 350.

1. (No answer.)

2. (No answer.)

3. No.

4. None.

5. (No answer.)

6. (a) Yes.

(b) Yes.

(c) Yes.

7. No.

8. No.

9. Have had none.

FAIRPORT HARBOR—A. J. MCCUE, H. O.

Population 1,200.

1. No sewerage.

2 (No answer.)

3. Yes.

4. None whatever.

5. (No answer.)

6. (a) To a certain extent under the control of the health officer.

(b) One.

(c) None.

7. Yes.

8. No.

9. Diptheria, 5 cases, 1 death; scarlet fever, 1 case.

FAIRVIEW—W. N. BROWN, H. O.

Population 400.

1. None.
2. (No answer.)
3. No.
4. No.
5. (No answer.)
6. (a) Yes.
   (b) Yes.
   (c) Have none.
7. (No answer.)
8. No.
9. Had no cases.

FERN BANK—JOHN OGDEN, H. O.

Population 275.

1. Garbage not removed promptly.
2. Only the neglect of families to obey orders.
3. No. Board only meets at call of the president on request of the health officer or any member of the board.
4. None.
5. (No answer.)
6. (a) Have none.
   (b) Have none.
   (c) Have none.
7. No.
8. No.
9. Had no cases.

FINDLAY—AMOS BEARDSLEY, H. O.

Population 18,000.

1. The emptying of sewage in the river in the heart of the city.
2. Principally the stringency of the times
3. Yes.
4. None have arisen.
5. That it be compulsory that a birth and death record be kept.
6. (a) Yes, with restrictions of one hog to a family and that to be kept only on certain conditions.
   (b) No.
   (c) Yes.
7. Yes, frequently.
8. Yes.
9. Diphtheria, 18 cases, 3 deaths; scarlet fever, 17 cases, 1 death; typhoid fever, 35 cases, 4 deaths; measles, 10 cases.

FOSTORIA—J. O. HESS, H. O.

Population 9,000.

1. There are none.
2. (No answer.)
3. Yes.
4. Harmonious.
5. None.
6. (a) No sir.
   (b) No.
   (c) None.
7. Yes sir. Daily inspection of milk.
8. Yes sir.
9. Diphtheria, 6 cases, 1 death; scarlet fever, 4 cases, death typhoid fever, 18 cases, 2 deaths; measles, 25 cases; whooping cough, 4 cases.

REMARKS A proper quarantine is always maintained with contagious diseases.

FRANKLIN—DR. N. A. HAMILTON, H. O.

Population 3,100.

1. None of any consequence, except those arising from time to time and chiefly from hog pens.
2. No ordinance to exclude hog pens when properly cared for.
3. Yes.
4. None.
5. (No answer.)
6. (a) Yes, when properly cared for.
   (b) No.
   (c) No.
7. No.
8. No.
9. Diphtheria, 3 cases, 1 death; scarlet fever; 3 cases.

FREMONT—DR. O. E. PHILLIPS, H. O.

Population 10,000.

1. A supply of good water for drinking purposes is the chief defect. Another is that there are a number of sewers that empty on top of the ground.
2. The difficulty to obtain a sufficient supply of pure water. In reference to sewers the council seems to care more about expense than health.
3. Yes, generally some times a quorum could not be obtained.

The council has refused to pay the health ...er and secretary on grounds that it is not ...al for them to be members of the board; also ... council wants to control the board of health other respects and do not pay proper attention notices served on them to remove nuisances.

5. In my opinion there should be a bill pre... ...anted to the legislature and passed giving the ...oards of healths the authority to draw orders ...irect on treasury without any reference to coun... ...cil. Perhaps it would be a good thing to pay members of the board one dollar a meeting in order to secure attendance.

6. (a) We have allowed some on conditions, that they were kept clean.
(b) No.
(c) No.

7. We have tested milk supplies but made no further inspections as yet.

8. No.

9. Diphtheria, 3 cases; scarlet fever, 8 cases, 4 deaths; tyyhoid fever, 24 cases, 8 deaths; measles, 20 cases; whooping cough, 1 case.

FT. RECOVERY—JOHN WATKINS, H. O.

Population 1,200.

1. Have none.

2. (No answer.)

3. Not regularly.

4. None whatever.

5. (No answer)

6. (a) Yes, if kept clean.
(b) They are outside.
(c) Yes.

7. No.

8. No.

9. Had none.

FULTONHAM—DR. C. B. MOORE, H. O.

Population 200.

1. Hog pens and privy vaults.

2. No reason.

3. Yes.

4. None.

5. No.

6. (a) Yes.
(b) No.
(c) No.

7. No.

8. Have none.

9. Had none.

GALION—A. BROKAW, H. O.

Population 7,500.

1. Pickel run is about the only sanitary defect at present which is thrown on the city to renovate, and we believe it will be renovated this year.

2. Only time asked for the disposing of same.

3. Yes.

4. No.

5. No.

6. (a) Yes.
(b) Yes.
(c) Yes.

7 Yes.

8. No.

9.—Diphtheria, 30 cases, 2 deaths; scarlet fever, 25 cases; typhoid fever, 26 cases, 2 deaths; measles, 33 cases; whooping cough, 62 cases.

GAMBIER—J. R. BUTLER, H. O.

Population 600.

1. Lack of drainage.

2. Railroad company did not comply with notice.

3. No.

4. Council has failed to set apart any money to apply to the expenses of said board.

5. I think there should be a fund set apart to pay the expenses of the board of health.

6. (a) Yes.
(b) No.
(c) No.

7. No.

8. (No answer.)

9. (No answer.)

REMARKS: Our village has been very healthy with the exception of a few cases of typhoid fever.

GENEVA—DR. G. G. BIGGAR, H. O.

Population 2,800.

1. Want of sewerage and water works.

2. Too expensive, having to go four miles the lake.

3. No.

4. We work in harmony.

5. No.

6. (a) Yes, if kept clean.
(b) No.
(c) Yes.

7. Yes.

8. No.

9. Diphtheria, 5 cases; scarlet fever, 7 cases; typhoid fever, 1 case, 1 death; measles, 5 cases; whooping cough, 5 cases.

GENOA—Dr. John K. Tretzell, H. O.

Population 1,000.

1. Privy vaults.
2. None.
3. No.
4. None.
5. If all boards and officers were paid a reasonable fee or salary by the corporations, then it would be an incentive for each and every man to act, and they no doubt would perform their duties faithfully.
6. (a) Yes.
   (b) None.
   (c) None.
7. No.
8. Have none.
9. Diphtheria, 3 cases; scarlet fever, 6 cases; typhoid fever, 4 cases; measles, 2 cases; whooping cough, 3 cases.

GERMANTOWN—Samuel A. Bausman, H. O.

Population 2,000.

1. At present we have none.
2. (No answer.)
3. Yes.
4. None.
5. None.
6. (a) Yes, but are kept clean.
   (b) On corporation line not near any houses.
   (c) Are in the country.
7. Yes.
8. Yes.
9. Scarlet fever, 18 cases; typhoid fever, 4 cases; measles, 1 case.

Remarks: Precautionary measures have been taken to promptly remove all sanitary defects as soon as reported, and especial care is given to our school houses and children.

GIRARD—Dr E. H. Wallace, H. O.

Population 3,000.

1. Water closets.
2. None.
3. Yes.
4. (No answer.)
5. (No answer.)
6. (a) Yes.
   (b) No.
   (c) Yes.
7. No.
8. No.
9. Diphtheria, 6 deaths; scarlet fever, 1 death.

GLENDALE—E. A. Sayre, H. O.

Population 1,417.

1. The absence of a good sewerage system.
2. The absence of a suitable outlet for same.
3. Yes.
4. None.
5. None.
6. (a) Yes, if kept clean.
   (b) Yes.
   (c) Yes.
7. No.
8. No.
9. Diphtheria, 11 cases, 1 death; scarlet fever, 4 cases; typhoid fever, 1 case; measles, 2 cases; whooping cough, 3 cases.

Remarks: I personally attend to all disinfection. I use plenty of sulphur, preferring to use too much rather than too little. Have had some trouble about parents of children sick with infectious diseases removing clothing from the room before fumigation. I have also had trouble (in some cases) because of the attending physician refusing to certify to recovery of patient.

GLENVILLE—C. Fovargue, H. O.

Population 500.

1. The want of proper sewerage.
2. The prohibiting us from emptying sewerage into the lake by the State Board of Health. The unnatural plans for otherwise disposing of same.
3. Yes.
4. None.
5. We believe that the Legislature should not pass the bill to annex this village to Cleveland, believing that we can take care of the health of the village better than the city will do it for us.
6. (a) No.
   (b) No.
   (c) Yes.
7. Yes, we have it examined by the health department of the city of Cleveland.
8. No, they nearly all peddle in the city and have to get permits there.
9. Diphtheria, 10 cases, 2 deaths; scarlet fever, 7 cases.

GRAFTON—C. N. Storrs, H. O.

Population 1,200.

1. None to endanger health.
2. (No answer.)

3. Yes

4. Not
hem.

5. No

6.

7.

8.

9.
1 de

[redacted]PEDALE—DR. L. H. CRAWFORD, H. O.

Population 650.

[redacted]Our health board is not attended regularly [redacted]aven part of the time we have no board, as [redacted]ll neglects to fill vacancy as terms expire.

[redacted]Neglect of council to keep board full, al[redacted]h we now have a full board.

[redacted]No.

[redacted]There has been none yet.

[redacted]No.

[redacted](a) Yes.
(b) No.
(c) Yes.

[redacted]No.

[redacted]No.

Measles, 5 cases; whooping cough, 25 cases.

HOYTVILLE—DR. C. F. BELL, H. O.

Population 500.

The worst is privy vaults. The board have [redacted]r taken any action on them. The mayor [redacted]ver met the board and we can not get a quorum.

2. Never have taken any action.

No.

4. Refused to pay for services last winter on a scarlet fever case.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) None here.

7. No.

8. No.

9. Scarlet fever, 2 cases, 1 death.

HUDSON—L. D. OSBORN, H. O.

Population 1,200.

1. A lack of water and sewerage.

2. A lack of money.

3. Yes.

4. (No answer.)

5. (No answer.)

6. (a) Do not.
(b) Not allowed.
(c) (No answer.)

7. Have not.

8. No.

9. Diphtheria, 8 cases; scarlet fever, 12 cases; measles, 4 cases; whooping cough, 8 cases.

HUNTSVILLE—DR. J. S. MONTGOMERY, H. O.

Population 600.

1. None in particular. We are getting most of them cleaned up. One is in regard to privy vaults. They are making these different now and better.

2. (No answer.)

3. No, meet once or twice a year.

4. The difficulty was this: The board of health established the price for health officer and council would not pay it, and it was only $15 per year. They (council) levied a sanitary fund and used the money in repairing streets.

5. (No answer.)

6. (a) Some in isolated quarters.
(b) No.
(c) No.

7. Yes.

8. No. Have only one and that all right.

9. Scarlet fever, 4 cases; typhoid fever, 30 cases; measles, 20 cases; whooping cough, 6 cases, 1 death.

REMARKS: The sanitary condition of our village is good, and most of our citizens take pride in keeping everything clean around their premises. We issue a circular changing it from year to year, stating on circular just what is needed and all particulars.

IRONTON—DR. J. W. LOWRY, H. O.

Population 14,000.

1. Court house building, city prison, dumping of garbage by city, drainage of swamps in southern part of city into the Ohio river, drainage from houses into the streets, the main sewers drain into the Ohio river.

2. Financial circumstances.

3. Yes.

4. Sanitary condition of city prison.

5. Board of health should have power to levy taxes for sanitary purposes.

6. (a) Yes—Rules say 100 feet from dwelling.
(b) Yes—Sorry to say.
(c) Yes.

7. No.

8. No.

9. Diphtheria, 101 cases, 19 deaths; scarlet fever, 19 cases, 8 deaths; typhoid fever, 9 deaths; measles, 4 cases.

JACKSON—W. H. WILLIAMS, H. O.

Population 6,000.

1. Improper and insufficient [redacted]

2. The want of water.

HAYESVILLE—DILLMAN ANDRESS, H O.

Population 450.

1. Vaults and manure piles.

2. There are no town ordinances against them.

3. They have not.

4. There has been no trouble between the board of health and the council.

5. I have no suggestions to make.

6. (a) We do.
(b) We do not.
(c) We do.

7. We do not examine nor inspect the stables, but we do the cows

8. We do not.

9. Typhoid fever, 2 cases, 1 death.

HEBRON—DR. R. M. BONAR, H. O.

Population 400.

1. Pig stys, compost heaps, and lack of sewer system.

2. No ordinance to prohibit pig stys and compost heaps. Ordinance would be obnoxious to majority. Lack of funds and people think it unnecessary to build sewers.

3. Has not held monthly meetings, but has met often enough to transact necessary business.

4. Had a dispute or two but of no consequence.

5. I do not think of any at present, though I have no doubt its efficiency could be increased.

6. (a) Yes.
(b) No.
(c) No general dairy; cows are kept by individuals

7. No.

8. No.

9. Scarlet fever, 2 cases; typhoid fever, 3 cases.

HIGGINSPORT—J. H. DONALD, H. O.

Population 1,000.

1. None special. We have our sanitary affairs in good condition at present.

2. (No answer)

3. Yes.

4. None.

5. No.

6. (a) No.
(b) No.
(c) No.

7. The milk is supplied from a farm three miles from town.

8. No.

9. Diphtheria, 6 cases, 1 death.

REMARKS: We have been free from an epidemic of any kind the past year and what we have had in the way of sickness was in mild form with no serious results.

HILLIARDS—DR. N. P. DAVIDSON, H. O.

Population 400.

1. Defective drainage, bad privy vault system, carelessness concerning removal of garbage.

2. The main reason urged is the lack of money for the first two and doubtless indifference is the reason in the third.

3. No; but we meet at the call of the president whenever there is any business to transact.

4. None.

5. No.

6. (a) No.
(b) No.
(c) No.

7. We have no such convenience except a few who keep a cow and furnish small quantities of milk to neighbors.

8. No; we have no dairymen.

9. Scarlet fever, 8 cases.

REMARKS: The cases of scarlet fever within the corporate limits ot the town have all been mild.

HILLSBORO—DR. WM. HOYT, H. O.

Population 4,000.

1. Want of proper sewerage.

2. Cost.

3. If a quorum is present. Occasionally no quorum.

4. Nothing of special importance.

5. No.

6. (a) Yes, where 200 square feet is given each hog.
(b) Yes.
(c) Nothing against it.

7. No.

8. No.

9. Scarlet fever, 12 cases.

REMARKS: We have had very little sickness. We have had typhoid fever and a few deaths from it. The board of health does not require a report or quarantine typhoid fever.

HOPEDALE—Dr. L. H. Crawford, H. O.

Population 650.

1. Our health board is not attended regularly and even part of the time we have no board, as council neglects to fill vacancy as terms expire.

2. Neglect of council to keep board full, although we now have a full board.

3. No.

4. There has been none yet.

5. No.

6. (a) Yes.
(b) No.
(c) Yes.

7. No.

8. No.

9. Measles, 5 cases; whooping cough, 25 cases.

HOYTVILLE—Dr. C. F. Bell, H. O.

Population 500.

1. The worst is privy vaults. The board have never taken any action on them. The mayor never met the board and we can not get a quorum.

2. Never have taken any action.

3. No.

4. Refused to pay for services last winter on a scarlet fever case.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) None here.

7. No.

8. No.

9. Scarlet fever, 2 cases, 1 death.

HUDSON—L. D. Osborn, H. O.

Population 1,200.

1. A lack of water and sewerage.

2. A lack of money.

3. Yes.

4. (No answer.)

5. (No answer.)

6. (a) Do not.
(b) Not allowed.
(c) (No answer.)

7. Have not.

8. No.

9. Diphtheria, 8 cases; scarlet fever, 12 cases; measles, 4 cases; whooping cough, 8 cases.

HUNTSVILLE—Dr. J. S. Montgomery, H. O.

Population 600.

1. None in particular. We are getting most of them cleaned up. One is in regard to privy vaults. They are making these different now and better.

2. (No answer.)

3. No, meet once or twice a year.

4. The difficulty was this: The board of health established the price for health officer and council would not pay it, and it was only $15 per year. They (council) levied a sanitary fund and used the money in repairing streets.

5. (No answer.)

6. (a) Some in isolated quarters.
(b) No.
(c) No.

7. Yes.

8. No. Have only one and that all right.

9. Scarlet fever, 4 cases; typhoid fever, 30 cases; measles, 20 cases; whooping cough, 6 cases, 1 death.

Remarks: The sanitary condition of our village is good, and most of our citizens take pride in keeping everything clean around their premises. We issue a circular changing it from year to year, stating on circular just what is needed and all particulars.

IRONTON—Dr. J. W. Lowry, H. O.

Population 14,000.

1. Court house building, city prison, dumping of garbage by city, drainage of swamps in southern part of city into the Ohio river, drainage from houses into the streets, the main sewers drain into the Ohio river.

2. Financial circumstances.

3. Yes.

4. Sanitary condition of city prison.

5. Board of health should have power to levy taxes for sanitary purposes.

6. (a) Yes—Rules say 100 feet from dwelling.
(b) Yes—Sorry to say.
(c) Yes.

7. No.

8. No.

9. Diphtheria. 101 cases, 19 deaths; scarlet fever, 19 cases, 8 deaths; typhoid fever, 9 deaths; measles, 4 cases.

JACKSON—W. H. Williams, H. O.

Population 6,000.

1. Improper and insufficient drainage.

2. The want of water.

8. Yes.

4. No difficulty.

5. The present statutes seem ample to cover our needs.

6. (a) Yes.
(b) No.
(c) No.

7. No.

8. No.

9. Scarlet fever, 2 deaths; typhoid fever, 4 deaths.

JACKSON CENTER—Dr. C. W. Moots, H. O.

Population 600.

1. Imperfect drainage system. Defective and improperly constructed privy vaults. Too many old stables and hog pens improperly kept.

2. A bankrupt council. Public opinion.

3. Yes.

4. (No answer.)

5. (No answer.)

6. (a) Yes.
(b) Yes.
(c) There are no applicants.

7. The majority have their own cows.

8. (No answer.)

9. (No answer.)

Remarks: As we were not organized until in July, and as there were many obstacles to overcome, this being a new thing to the people, we are not prepared to give anything like a full report to the last question. Suffice it to say, that we had an extensive epidemic of typhoid fever, but had a low mortality rate. We also had one case of scarlatina in our corporation, but by active measures were able to restrict the further spread of the same. The council is unable to furnish us with the necessary books, blanks, etc., upon which to keep full records, but we hope to hit upon some plan for the coming year by which we will be enabled to make you a full report.

JACKSONVILLE—Dr. E. H. Hartmann, H. O.

Population 800.

1. Our vaults.

2. We have commenced to modify the vault system and with time expect to improve it to a good standard.

3. Not always.

4. None.

5. None.

6. (a) No restriction.
(b) No restriction.
(c) None.

7. No.

8. (No answer.)

9. Typhoid fever, 1 case.

JEFFERSON—Dr. A. L. Arner, H. O.

Population 1,500.

1. Entire lack of sewerage and the requisite means to build sewers.

2. Lack of sufficient funds.

3. Yes.

4. None.

5. Legislate so as to empower local boards of health to act promptly and make the law so plain that we may know what we may do and what we may not.

6. (a) Yes.
(b) No.
(c) Yes.

7. Yes.

8. No.

9. Measles, 40 cases; whooping cough, 40 cases.

JENERA—J. W. Hull, H. O.

Population 300.

1. Surface wells which are being replaced by artesian wells.

2. (No answer.)

3. No.

4. None.

5. None.

6. (a) Yes.
(b) None.
(c) None.

7. No.

8. No.

9. Typhoid fever, 2 cases; whooping cough, 30 cases.

JERUSALEM—J. A. Latham, H. O.

Population 250.

1. (No answer.)

2. (No answer.)

3. They do.

4. (No answer.)

5. (No answer.)

6. (a) Yes.
(b) Not any.
(c) Not any.

7. We have nothing of that kind.

8. (No answer.)

9. (No answer)

REMARKS: We have had some cases of scarlet fever, but I quarantine the houses and stop it at once.

JEWETT—J. R. ROBERTS, H. O.

Population 1,000.

1. (No answer.)
2. (No answer;
3. (No answer)
4. None.
5. (No answer.)
6. (a) Under restrictions.
   (b) None.
   (c) None.
7. (No answer.)
8. (No answer.)
9. Typhoid fever, 10 cases. 2 deaths.

JUNCTION CITY—DR. P. A. GORDON, H. O.

Population 400.

1. Privies and hog pens
2. Lack of education in sanitary matters.
3. No.
4. None.
5. (No answer.)
6. (a) Yes.
   (b) No.
   (c) No.
7. No
8. No.
9. Scarlet fever, 4 cases: typhoid fever, 30 cases.

REMARKS: Our people, both in village and township, seem fairly well interested in sanitary matters, and improvements on that line are noticeable, particularly in drainage, wells and the disposal of garbage and destroying of dead animals.

KENT—L. G. REED, H. O.

Population 4,000.

1. Earth wells in the lower or southern part and the want of sewerage in the business portion, yet this is regarded as an exceptionally healthy town. Notwithstanding, we have ten physicians who live by their professions.
2. Poverty.
3. No, we have but four qualified members, and they have not met since July.
4. No trouble.
5. Have the laws or rules made simple plain and rigid, so that they cannot be misinterpreted, necessitating carrying into the courts. See section 6923 for an example. Also pay members of the board a reasonable compensation for service rendered.
6. (a) Yes, to our great annoyance.
   (b) No, except for the slaughter of poultry.
   (c) No, there is none, but they could be kept if any one so desired.
7. No, it never has been done and is not now.
8. We do not.
9. Diphtheria, 7 cases, 2 deaths; scarlet fever, 5 cases; measles, 2 cases.

REMARKS: Physicians do not report cases of typhoid fever except two, viz, Drs. Andrews and C. W. Hains. There have been a few mild cases that came to my knowledge in a round about way. I presume there has been at least four deaths from this cause within the past year, and yet I am not certain about this.

LAURA—W. S. OLWIN, H. O.

Population 400.

1. Not any.
2. Not any.
3. They have missed some.
4. Not any.
5. Not any.
6. (a) Yes.
   (b) No.
   (c) No.
7. Yes.
8. No.
9. Diphtheria, 1 case; typhoid fever, 1 case.

LEBANON—DR. F. H. FROST, H. O.

Population 3,500.

1. Water supply and lack of sewerage.
2. We are putting in water works, which I think will overcome some of the defects.
3. No.
4. None.
5. No.
6. (a) Yes, although they are an acknowledged nuisance.
   (b) No
   (c) No law on the subject.
7. No.
8. No.
9. Diphtheria, 12 cases, 2 deaths; scarlet fever, 8 cases; typhoid fever, 4 cases; measles, 18 cases.

LEESBURG—DR. H. A. BERSON, H. O.

Population 1,000.

1. No drainage. Privies located on the alleys on the ground. No provision for disposal of contents.

2. The people will not change the conditions.

3. No.

4. None.

5. No, we do not enforce such laws as we have.

6. (a) Yes.
(b) Yes.
(c) Yes.

7. No.

8. No.

9. Had none.

REMARKS: We have one animal slaughter-house and one for poultry, both generally filthy: the latter is located in center of the village. Yet the past year has been a very healthy one in spite of the above. We will doubtless "catch it" in time, but until we do, few "reforms" can be carried out.

LINWOOD—W. S. REYNOLDS, H. O.

Population 2,000.

1. Want of sewerage.

2. (No answer.)

3. Not since annexation has been agitated.

4. None.

5. I have not.

6. (a) Yes, under restrictions.
(b) No.
(c) No.

7. The most of our citizens use Pasteurized milk.

8. No.

9. Scarlet fever, 2 cases; typhoid fever, 3 cases; measles, 6 cases.

LISBON—DAVID H. ELLIS, H. O.

Population 3,000.

1. Our sewers should extend into the water and the end should be under water: there should be no dead ends to our water pipes.

2. The council claims to have no money; they have been notified.

3. Yes.

4. Not much; nothing serious.

5. Would suggest the board of health be elected by the people and have the power to levy taxes for their own use.

6. (a) On the outside of town.
(b) No, but one has refused to move.
(c) None.

7. No.

8. No.

9. Diphtheria, 1 death; typhoid fever, 4 deaths; whooping cough, 1 death.

LITHOPOLIS—DR. J. E HOLMES, H. O.

Population 400.

1. The town is situated on stone with the cemetery on a hill at the edge of corporation. All surface water passes through the town.

2. Can't be helped.

3. No.

4. No.

5. The laws are stringent enough if properly enforced.

6. (a) Yes.
(b) No.
(c) Yes.

7. No.

8. No.

9. (No answer.)

LOCKLAND—VAL HARTING, H. O.

Population 3,000.

1. The drainage from the starch factory into the west fork of Mill creek is a source of great complaint and is the chief defect in our village.

2. We permit it for several reasons. It gives employment to about 100 people living here, and supplies feed for stock and dairy cattle and a good revenue to the town by way of taxes.

3. No, only by call.

4. None; we work in harmony.

5. None.

6 (a) Yes, but are going to abolish them.
(b) No.
(c) No.

7. No.

8. No.

9. Diphtheria, 12 cases, 4 deaths; scarlet fever, 7 cases; typhoid fever, 11 cases, 1 death; measles, 12 cases.

LOGAN—A. K. SMITH, H. O.

Population 3,400.

1. Sanitary drainage.

2. The contract for sanitary drainage has been let, and work will commence in near future.

3. Yes.

4. None.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) None.

7. No.

8. No.

9. Scarlet fever, 9 cases: typhoid fever, 3 cases, 1 death.

LONDON—DR. J. F. KIRKPATRICK, H. O.

Population 5,000.

1. Lack of proper sewerage and the draining of privy vaults into an open water way.

2. Inability to get the citizens to take hold of sewerage.

3. No.

4. Have had none.

5. No.

6. (a) No.
(b) Yes.
(c) No.

7. No.

8. No.

9. Diphtheria, 10 cases, 1 death; scarlet fever, 27 cases.

LORAIN—DR. S. S. COX, H. O.

Population 11,000.

1. Outlet of sewerage system without purification of sewage.

2. Lack of funds.

3. Yes.

4. (No answer.)

5. Would suggest that boards of health be allowed to purchase quarantine grounds or make it compulsory for council to do so.

6. (a) Yes.
(b) Yes.
(c) Yes.

7. No.

8. No.

9. Scarlet fever, 7 deaths; typhoid fever, 17 deaths.

LYNCHBURG—MARTIN V. NOLDER, H. O.

Population 950.

1. Have none.

2. (No answer.)

3. They do.

4. There has been none.

5. I have none.

6. (a) If kept clean.
(b) None.
(c) None.

7. They are kept by private families and in good condition.

8. (No answer.)

9. Scarlet fever, 8 cases; typhoid fever, 3 cases, 1 death; whooping cough, 5 cases.

MCARTHUR—DAVID LANTZ, H. O.

Population 1,000.

1. None.

2. None.

3. Yes.

4. None.

5. Yes; the health officer's salary to be increased.

6. (a) Yes.
(b) Yes.
(c) None in the town.

7. No.

8. None here.

9. Diphtheria, 1 case, 1 death; typhoid fever, 5 cases, 1 death.

MCCLURE—DR. J. W. SHARPE, H. O.

Population 600.

1. Improper drainage. Pollution of an open ditch running from a stave factory through the residence part of the village.

2. Lack of finance prevents efficient sewerage. Antagonism between the county and village authorities as to the ditch.

3. No.

4. None.

5. Make it compulsory for the council of small villages to see that the members of health board are regularly appointed and that the board is a legal body.

6. (a) No.
(b) No.
(c) No.

7. No.

8. No.

9. Diphtheria, 3 cases; scarlet fever, 5 cases; typhoid fever, 11 cases, 2 deaths; measles, 2 cases; whooping cough, 10 cases.

REMARKS: The council in this village does not make much effort to co-operate with the board. At present we have only three legal members of same. Hard to enforce sanitary legislation in village because the council won't support the health board. A lack of interest on all sides prevents efficient and thorough work. Failure on part of council to appoint members to serve on board: no antagonism, but complete lack of any effort to constitute a properly qualified board.

McCONNELLSVILLE—J. D. MARIS, H. O.

Population 2,000.

1. None.
2. None.
3. As a rule.
4. None.
5. None.
6. (a) No.
   (b) Yes, in outskirts.
   (c) Yes.
7. Yes.
8. No.
9. Scarlet fever, 1 case: whooping cough, many cases.

MADISONVILLE—DR. E. A. FLINN, H. O.

Population 8,200.

1. A systematic removal of garbage, etc.
2. Council says taxes are too high now: have been recommending to council a levy for such purpose.
3. No: everything has been in such good shape this summer that board has met as called by health officer.
4. Council reduced the salaries of health officer and clerk from $100 to $25 per annum; health officer two-thirds and clerk one-third of same. Salary for quarter is due now: don't know what they will say when they get bill for same at old figure.
5. No.
6. (a) No.
   (b) No.
   (c) No.
7. Yes.
8. No.
9. Typhoid fever, 2 cases.

MAGNOLIA—WM. JUDD, H. O.

Population 350.

1. Not good sewerage; shallow water closets with no drainage, and surface water wells fourteen to sixteen feet deep.
2. Lack of funds prevents proper sewerage, and as for wells there have been some deep wells put in this fall.
3. Yes.
4. (No answer.)
5. To pay the officers more.
6. (a) Yes.
   (b) No.
   (c) No.
7. (No answer.)
8. No.
9. (No answer.)

MALTA—Z. WISEMAN, H. O.

Population 900.

1. Defective privy vaults and inefficient drainage.
2. Too small a place to maintain proper sewerage.
3. No.
4. None.
5. None.
6. (a) Yes.
   (b) Yes.
   (c) No.
7. No.
8. No.
9. Typhoid fever, 15 cases; whooping cough, 10 cases.

MANCHESTER—DR. R. A. STEPHENSON, H. O.

Population 2,500.

1. Want of proper drainage. Permitting hogs to be kept in pens within the corporate limits. Sufficient attention is not paid to defective privy vaults.
2. Refusal on part of owners to repair vaults. Failure of council to pass ordinance prohibiting hogs to be kept in corporation.
3. No.
4. None other than simply a failure on part of council to take proper action.
5. If the law was compulsory in regard to council passing such ordinances as board of health might deem expedient to the welfare of the citizens.
6. (a) Yes.
   (b) No.
   (c) No.
7. No; our dairies are in the country some three or four miles distant.
8. No.

9. Diphtheria, 1 case: typhoid fever, 5 cases, 1 death.

REMARKS: One cass that died and reported as typhoid fever, was only two years old, we have reason to doubt. It is impossible, seemingly to get a report of the number of contagious diseases, only that of diphtheria or scarlet fever, other contagious diseases are very seldom reported. Families often times not calling a physician for measles or whooping cough.

MARENGO—EDGAR E. KERR, H. O.

Population 800.

1. (No answer.)
2. (No answer.)
3. No.
4. (No answer.)
5. No.
6. (a) Yes.
   (b) There is none.
   (c) There is none.
7. No.
8. (No answer.)
9. Diphtheria, 2 cases: scarlet fever, 2 cases; whooping cough, 2 cases.

MARION—GEO. W. BLAIN, H. O.

Population 10,000.

1. Sanitary condition very good.
2. (No answer.)
3. No.
4. Will not act in harmony with the board of health.
5. To allow the board of health to have control of its own finances without having to go to city council for every little expenditure.
6. (a) In the suburbs.
   (b) (No answer.)
   (c) (No answer.)
7. No; but intend to do so in the future.
8. No.
9. Diphtheria, 18 deaths: typhoid fever, 8 deaths.

MARYSVILLE—DR. GEORGE MILLER, H. O.

Population 3,000.

1. Lack of good sewerage system.
2. A lack of money, the taxes now being three per cent.
3. Not strictly.
4. Council objects to salary of officers, $100 per annum being paid secretary, sanitary policeman and health officer. ($100 each.)
5. None. I believe it is good enough if councils of cities and towns would let boards of health enforce what we already have.
6. (a) No.
   (b) No.
   (c) No.
7. No.
8. No.
9. Scarlet fever, 12 cases; typhoid fever, 87 cases, 11 deaths; measles, 1 case.

REMARKS: Physicians in town have not reported cases of typhoid fever during August, September and October. We had an outbreak of typhoid fever, some very malignant cases; nearly all were users of well water. Scarlatina has been very mild and not a single death. With exception of typhoid, our city has been remarkably free from diseases of any kind.

MECHANICSBURG—DR J. T. SIDENER, H. O.

Population 2,200.

1. Our town is in an excellent sanitary condition with the exception of allowing hog pens and slaughter-houses in corporation. I expect to urge the passing of ordinances prohibiting these; there is none at present time.
2. Carelessne s on part of health officer and council in the past.
3. Meetings are called when considered necessary by mayor and health officer.
4. (No answer.)
5. (No answer.)
6. (a) So far they have been allowed.
   (b) Yes
   (c) Yes.
7. Yes.
8. No.
9. Scarlet fever, 3 cases.

REMARKS: Since I was elected health officer we have had several cases called typhoid fever and two or three deaths, but none of them were ever reported to me by attending physician. I have given notice that I will expect in the future, all cases reported in accordance to rules of State Board of Health.

MELROSE—WM. STROFF, H. O.

Population 500.

1. Nothing very bad.
2. (No answer.)

3. Have missed one or two meetings on account of nothing at all to do.

4. (No answer.)

5. (No answer.)

6. (a) Yes.
(b) No.
(c) No.

7. No; it has never seemed necessary here. Not much milk sold in a town this size.

8. No.

9. Scarlet fever, 5 cases, 3 deaths; typhoid fever, 6 cases, 3 deaths.

REMARKS: There have been several deaths in the last year, but not many of the above diseases. The health of this village has been extremely good, especially of children.

MENDON—DR. J. M. MILLER, H. O.

Population 600.

1. Privies and hog pens, also river in summer, (St. Mary's).

2. Can not get health board to meet to take action on it.

3. No.

4. Not any.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) Yes.

7. No.

8. No.

9. Typhoid fever, 4 deaths.

MENTOR—DR. J. W. LOWE, H. O.

Population 800.

1. Neglect to properly clean and disinfect water closets, kitchen sinks, and cellars as often as occasion may seem to demand. I also regard shallow wells as a sanitary defect on account of being supplied with impure surface water instead of spring water.

2 The health officer's salary which is only $10 per year is not sufficient remuneration for the time necessary to inspect and instruct the people in reference to this matter.

3. No.

4. The council seem to count the cost rather than the importance of such a board.

5. Make it necessary for the council in villages to create a board of health fund and that the health officer be provided with proper blank notices in reference to cleaning yards, cellars, sinks and water closets.

6. (a) Only in the suburbs.
(b) Only in the suburbs.
(c) Only in the suburbs.

7. No.

8. No.

9. Diphtheria, 1 case; scarlet fever, 8 cases; typhoid fever, 11 cases; measles, 47 cases; whooping cough, 3 cases.

REMARKS: We find it difficult to secure proper blanks with which to carry out the requirements of law. We purchased our supply from E. L. Barrett & Son, Springfield, Ohio. The record book for instance is not indexed neither is it paged or suitable in any way for villages and it seemed the best we could get. With no appropriation from the council or other fund with which to carry out the requirements of law the board of health here is not a very active body. A little spurring from the State Board occasionally would help us to keep awake and moving.

MIAMISBURG—DR. HENRY SCHOENFIELD, H. O.

Population 3,500.

1. Bad vault system is the only bad defect that we have to contend with.

2. The greatest reason is getting the people to go to the expense of making such changes as will remove the defect.

3. Yes.

4. The only difficulty has been in trying to impress the importance of appointing a meat, milk, vegetable and dairy inspector.

5. One of the most important things is making more plain the parts of the state law that are applicable to towns and villages.

6. (a) Yes, but our rules are so rigid that we have but few.
(b) No.
(c) No.

7. No, have failed in impressing the importance of the fact upon council sufficient that they will appoint one.

8. No.

9. Diphtheria, 1 case, 1 death; scarlet fever, 2 cases; typhoid fever, 8 cases, 3 deaths; whooping cough, 6 cases.

MIDDLETOWN—DR. G. D. LUMMIS, H. O.

Population 10,000.

1. Hydraulic running through portion of city fed by Big Miami river at state dam where river is low, not water enough to feed both canal and hydraulic hence water in hydraulic was low during most of last summer.

2. Low river.

3. Meeting subject to call of mayor or health officer.

4. None.

5. (No answer.)

6. (a) No.
(b) Yes.
(c) One small one just inside.

7. No.

8. No.

9. Diphtheria, 7 cases, 1 death; scarlet fever, 20 cases; typhoid fever, 13 cases, 2 deaths.

REMARKS: Death rate per 1,000 of population of 1891, 10.14, death rate per 1,000 estimated population 9.5. Expenses for year including salaries, $359.35.

MILFORD—DR. FRANK C. CURRY, H. O.

Population 1,200.

1. None to speak of.

2. None.

3. Not in part of the year but will from this time on.

4. Refusal of council to pay bills approved by board of health.

5. Some means to give boards of health funds under their own control.

6. (a) Order against but can't enforce.
(b) Order against but law does not sustain.
(c) No.

7. No.

8. No.

9. Typhoid fever, 7 cases; measles, 6 cases.

MILLERSBURG—DR. J. E. WHITMAR, H. O.

Population 1,925.

1. None, except hog pens.

2. Council refuses to pass ordinance sufficient to abate the nuisance.

3. No.

4. Yes; council until in December, 1895, refused to pass an ordinance to create a health board in accordance of late law. In December such an ordinance was passed and now board is fully organized.

5. No.

6. (a) Yes.
(b) Yes.
(c) Yes.

7. No.

8. No.

9. Diphtheria, 1 case; typhoid fever, 1 case, 1 death; measles, 10 cases.

MINERAL RIDGE—WILL A. OHL, H. O.

Population 1,200.

1. No sewerage system and hog pens.

2. Town not able to put in sewer.

3. No; not every month.

4. None.

5. By having some kind of a fixed salary for health officers and clerks of boards.

6. (a) Yes.
(b) No.
(c) Have none.

7. No.

8. No.

9. Typhoid fever, 4 cases, 3 deaths.

MINERVA—THOMAS J. ROACH, H. O,

Population 1,500.

1. Allowing hog pens within the corporation limits.

2. It is urged that it is a benefit to the poor to allow them to raise hogs within the corporation.

3. No; it has not held monthly meetings.

4. None.

5. I would suggest that each township, and the cities and villages therein, have an appropriate building fitted up properly for their use for the isolation and care of those afflicted with infectious and contagious diseases. The said building, or hospital to be maintained by proper taxation.

6. (a) Yes.
(b) No.
(c) We have none.

7. We do not.

8. No.

9. Diphtheria, 7 cases; scarlet fever, 6 cases typhoid fever, 4 cases, 2 deaths.

MORROW—DR. BENJAMIN C. STILES, H. O.

Population 1,000.

1. Lack of a sewerage system.

2. Lack of public spirit.

3. Have met whenever necessity required. We hold four regular meetings per year: March, June, September and December.

4. None have arisen.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) Yes.

7 No complaint as to quality of milk and therefore no examination made.

8. No.

9. Typhoid fever, 1 case.

MT. GILEAD—GEO. W. JACKSON, H. O.

Population 2,000.

1. The natural conditions are good: situated on high ground, with large stream in valley below town, affording good natural drainage. Chief defect is water supply; have no water works system. We depend on wells, which for several falls now have fallen very low, with almost a water famine.

2. Council will not supply water works system.

3. Yes.

4. No difficulty with present board or council.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) Yes.

7. No: it has never been done to my knowledge, but the milk furnished is of good quality and perfectly pure.

8. No.

9. Scarlet fever, 10 cases, 2 deaths; typhoid fever, 2 cases.

REMARKS: This town has always been remarkably free from epidemics of contagious disease, the only one in many years was that of scarlet fever of a year ago. Typhoid cases are isolated and limited to two or three any one year. Within the last eight years at least, there have been but three cases of diphtheria. In 1894, whooping cough, however, was very prevalent.

MOUNT PLEASANT—GEORGE A. WALKER, H. O.

Population 800.

1. We think that if hog pens and manure pens in the alleys were removed, it would be much better, as there are quite a number of hogs kept in town.

2. The people object of not having the privilege of raising hogs.

3. We hold regular meetings during spring and summer months, and we have call meetings balance of the year when it is necessary, and at call of the mayor.

4. We do not have any difficulties between the council; all is pleasant, and we work in harmony with each other.

5. No.

6. (a) We do: but our opinion would be better if there was not any.
(b) We do not allow any.
(c) We allow dairies, but are kept clean.

7. We do not.

8. We do not.

9. Scarlet fever, 16 cases; typhoid fever 13 cases.

MT. STERLING—DR. R. H. TRIMBLE, H. O.

Population 1,200.

1. Want of sewage.

2. (No answer.)

3. Yes.

4. (No answer.)

5. (No answer.)

6. (a) No.
(b) No.
(c) No.

7. Yes.

8. No.

9. Diphtheria, 1 case; scarlet fever 12 cases; typhoid fever, 16 cases, 1 death; measles, 9 cases; whooping cough, 30 cases.

MURRAY CITY—DR. T. J DILLINGER, H. O.

Population 800.

1. (1) The water supply in dry weather is very poor. (2) Too little interest taken by the majority of our people in regard to cleanliness. (3) Too little disinfectants used in privies and pig pens. (4) Neglect of good drainage in some places. (5) Poorly constructed houses.

2. There are no just reasons, in part at least. The people will not attend to these sanitary defects unless they are compelled to do so.

3. We have no health board in this village at present. No one feels it his duty to work for nothing. The council has appointed, but the parties refuse to serve. I am urging all I can for the betterment of the town. But I do not feel like lawing any body alone because he will not respond to my behests. I have improved things very much since I have been at Murray City, but much more can be done.

4. There have been no serious difficulties between the two. We had a full board of health when I was elected health officer of the village, but they moved away, and could not be replaced by other members.

5. I conscientiously believe if a law was passed to compensate the members of the board of health for their time and services rendered, they would have some interest at stake, and good men would serve on such boards.

6. (a) Yes, but I wish they did not.

(b) I have succeeded in getting rid of this nuisance.

(c) The cows run out on the commons.

7. Yes, I look after the milk as much as possible. One person usually gets milk of his neighbor. No one peddles milk. We have very few cow stables. Most of the cows here are like our coal houses, all out of doors.

8. Yes, license is required of all peddlers.

9. Scarlet fever, 3 cases: typhoid fever, 5 cases, 2 deaths; whooping cough, 20 cases, 1 death.

REMARKS: We have had extremely good health in our village the past year, considering the facilities and surroundings. We will try to secure a good board of health in April, and endeavor to improve all the sanitary defects as far as possible.

NEVILLE—DR. N. S. HILL, H. O.

Population 450.

1. Unwillingness of the people to be quarantined during epidemics of diphtheria, scarlet fever, etc.

2. Want of education.

3. No.

4. Never had any.

5. None.

6. (a) Yes.
(b) No.
(c) No; quite a number of families keep one cow and supply their neighbors with milk.

7. No.

8. No.

9. (No answer.)

REMARKS: This town has been remarkably free from epidemic diseases this past year. Several severe cases of typhoid fever prevailed in the county.

NEWARK—DR. J. P. H. STEDEM, H. O.

Population 18,000.

1. More and better sewers; means of disposing of garbage; leniency in the enforcement of existing sanitary laws and negligence of many of our physicians in reporting contagious diseases, and want of disinfection of such diseased localities.

2. Want of popular interest in these matters or ignorance of the necessity of attention thereto.

3. Yes; but at several meetings no business was transacted because of want of quorum.

4. The board's recommendation for improvement of sanitary condition of city prison, thus far remains unheeded.

5. No.

6. (a) No.
(b) No.
(c) No.

7. I have not examined milk, but I have inspected dairy stables.

8. No.

9. (No answer.)

REMARKS: There has been no record kept of above diseases, hence I can not furnish statistics.

NEW CARLISLE—DR. BEN. DAVIS, H. O.

Population 1,200.

1. Water supply.

2. (No answer.)

3. Yes.

4. None.

5. Should require health officer to be a physician.

6. (a) Yes.
(b) No.
(c) No.

7. No.

8. No.

9. Typhoid fever, 8 cases.

NEW CONCORD—WM. N. SMITH, H. O.

Population 800.

1. Water supply from wells; defective privy arrangements.

2. None.

3. No; meetings have been irregular.

4. None.

5. No.

6. (a) Yes.
(b) There are none.
(c) Yes.

7. No.

8. No.

9. Typhoid fever, 18 cases, 2 deaths.

NEW LEXINGTON—LAWRENCE KEATING, H. O.

Population 2,200.

1. The lack of pure water.

2. We need a system of water works.

3. Have not been able always to secure a quorum.

4. None.

5. (No answer)

6. (a) Yes.
(b) Yes.
(c) Yes.

7. No.

8. No.

9. Diphtheria, 7 cases, 1 death; scarlet fever, 2 cases, typhoid fever, 5 cases.

NEW LONDON—A. M. TURNER, H. O.

Population 1,200.

1. (No answer.)

2. (No answer.)

3. Yes.

4. (No answer.)

5. To require physicians to report typhoid fever the same as diphtheria or scarlet fever.

6. (a) Yes, by members signing permit.
(b) No.
(c) No.

7. No.

8. No.

9. Measles, 4 cases.

NEW MADISON—J. F. S. HAGEMAN, H. O.

Population 500.

1. Sanitary condition good at the present time.

2. (No answer.)

3. Yes.

4. (No answer.)

5. (No answer.)

6. (a) Yes.
(b) No.
(c) No.

7. See that all stables are kept clean and that cows are in a healthy condition.

8. No.

9. Typhoid fever, 8 cases, 1 death; measles, 2 cases.

NEW PARIS—DR. LOUIS DUNN, H. O.

Population 1,000.

1. The use of water from shallow wells.

2. Money to secure deep wells.

3. No.

4. No difficulties have arisen.

5. No.

6. (a) Yes.
(b) No.
(c) Yes.

7. No.

8. No.

9. Scarlet fever, 3 cases; typhoid fever, 8 cases; measles, 2 cases.

NEW PHILADELPHIA—GEO. H. BECK, H. O.

Population 6,500.

1. Filthy alleys, streets and cellars.

2. Inefficiency of street commissioner and sanitary inspector.

3. No.

4. (No answer.)

5. None.

6. (a) Yes.
(b) No.
(c) Yes.

7. No.

8. No.

9. Diphtheria, 24 cases, 4 deaths; scarlet fever, 11 cases; typhoid fever, 51 cases, 8 deaths; measles 120 cases.

NEW STRAITSVILLE—MARION TRUEX, H. O.

Population 2,500.

1. (1) On Main street water is bad. (2) Main street sewer is defective. (3) Town hall and jail sewer defective.

2. Neglect of health board.

3. About every other month.

4. None. Council always has done what the board requested.

5. Health boards too large; should only have three members and those paid. At present difficult to get members together for work.

6. (a) Yes.
(b) Yes; but kept clean.
(c) No; none here.

7. No; none here.

8. No; none here.

9. Scarlet fever, 5 cases, 1 death.

NEW VIENNA—GEO. R. CONRAD, H. O.

Population 800.

1. Open ditches

2. The expense of sewerage.

3. With few exceptions, yes.

4. Not any.

5. No.

6. (a) No.

(b) Yes.
(c) No; except private.

7. No.

8. No.

9. Scarlet fever, 7 cases; typhoid fever, 1 case.

NEW WASHINGTON—GEO. B. WOLF, H. O.

Population 1,100.

1. (No answer.)

2. (No answer.)

3. No.

4. (No answer.)

5. (No answer.)

6. (a) Yes.
(b) Yes.
(c) None.

7. Are none.

8. (No answer.)

9. Measles, 25 cases; but they were not all reported.

REMARKS: I remember of but one case of typhoid fever, as I was only appointed about three months ago.

NILES—DR. C. C. WILLIAMS, H. O.

Population 6,000.

1. Lack of sewerage.

2. The council has not yet seen fit to construct sewers, which are almost a necessity with water works.

3. Yes.

4. None.

5. None at present.

6. (a) No.
(b) No.
(c) No.

7. Yes.

8. No.

9. Diphtheria, about 12 cases; scarlet fever, about 70 cases, 4 deaths; typhoid fever, about 10 cases, 1 death; measles, about 200 cases, 2 deaths.

NORTH AMHERST—DR. N. H. CORNWELL, H. O.

Population 2,000.

1. In good condition.

2. (No answer.)

3. As a general thing.

4. None.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) No.

7. No.

8. (No answer.)

9. Typhoid fever, 16 cases.

NORTH LEWISBURG—A. SPAIN, H. O.

Population 1,100.

1. Must be water supply, as we have more cases of typhoid fever than any other one disease.

2. Unavoidable to a great extent, as we have to depend on wells for water.

3. No.

4. (No answer.)

5. (No answer.)

6. (a) Yes.
(b) There are none.
(c) None.

7. No.

8. No.

9. Scarlet fever, 5 cases; typhoid fever, 18 cases, 6 deaths; whooping cough, 1 case, 1 death.

NORWOOD—DR. J. C. CADWALLADER, H. O.

Population 7,000.

1. Garbage, sewerage. Measures are now being adopted to rectify same.

2. Carelessness.

3. Yes.

4. (No answer.)

5. (No answer.)

6. (a) No.
(b) Yes.
(c) Yes.

7. No.

8. No.

9. Diphtheria, 6 cases, 2 deaths; scarlet fever, 12 cases; typhoid fever, 13 cases, 3 deaths; measles, 20 cases, 1 death; whooping cough, 40 cases, 4 deaths.

OAK HARBOR—DR. F. S. HELLER, H. O.

Population 1,700.

1. Want of water works.

2. Want of funds to build them.

3. Yes.

4. None.

5. No.

6. (a) In certain parts of corporation.
(b) No.
(c) No.

7. No.

8. No.

9. Typhoid fever, 10 cases, 1 death; measles, 1 case.

OAK HILL—W. W. MORGAN, H. O.

Population 600.

1. (No answer).

2. (No answer.)

3. No.

4. I can not get the council to make an appropriation.

5. (No answer.)

6 (a) Yes.
(b) No.
(c) No.

7. No.

8 (No answer.)

9. (No answer.)

OAKWOOD—JOHN H. STOVER, H. O.

Population 500.

1. Privy vaults, hog pens, manure piles, waste paper and accumulation of rubbish of various kinds. We have pretty good drainage and excellent water, most of the wells are deep. Tubular getting water in the rocks.

2. No reason, but only indifference and carelessness.

3. No; only met twice.

4. No difficulty has arisen between council and board of health, neither pays much attention to health matters.

5. Nothing, unless it would be to increase the penalty for such neglect.

6. (a) Yes.
(b) Slaughtering is done within corporate limits.
(c) None.

7. (No answer.)

8. (No answer.)

9. Typhoid fever, 1 case.

OBERLIN—E. L. BURGE, H. O.

Population 4,630.

1. (No answer.)

2. (No answer.)

3. Met whenever there was any business to transact.

4. Everything has been peaceful.

5. (No answer.)

6. (a) In some of the outer edges.
(b) No.
(c) No law on the subject.

7. No regular inspection.

8. No.

9. Scarlet fever, 5 cases; typhoid fever, 19 cases, 2 deaths.

REMARKS: Measles and whooping cough not reported by physicians although some cases were heard of which were treated by parents.

OHIO CITY—JAMES MCLEAN, H. O.

Population 700.

1. Privy vaults.

2 None remaining uncleaned.

3. Yes.

4. (No answer.)

5. (No answer.)

6. (a) Yes.
(b) None.
(c) None.

7. No.

8. Have not heretofore; shall I?

9. (No answer.)

REMARKS: I also consider the village is in good healthy condition and everything neatly cleaned up.

OLMSTED FALLS—C. H. BARNUM, H. O.

Population 400.

1. Sanitary condition of village good.

2. (No answer.)

3. Yes.

4. No trouble.

5. No.

6. (a) Yes.
(b) One, used very little.
(c) None.

7. No.

8. No.

9. Scarlet fever, 2 cases.

ORRVILLE—DR. H. BLANKENHORN, H. O.

Population 2,000.

1. Pig pens and improper vaults.

2. Dollars and cents.

3. Almost every month.

4. None.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) No.

7. No.

8. No.

9. Scarlet fever, 25 cases, 1 death; typhoid fever, 2 cases; measles, 40 cases

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OTTAWA—FRANK LIGHT, H. O.

Population 2,500.

1. Want of proper sewerage and water works.

2. Lack of funds in city treasury.

3. No not regularly.

4. None known.

5. None.

6. (a) They are prohibited by ordinance but not strictly enforced. Where any complaint is made they are required to be removed at once.
(b) Yes, one which is 600 to 700 feet from any dwelling.
(c) No.

7. No.

8. No.

9 Typhoid fever, 5 deaths; measles, 1 case; whooping cough, 1 death

REMARKS: There have been a very large number of cases of typhoid fever all over the county, more than at any time in the last 13 years. None on hand at this time. A great many shallow wells are used for drinking purposes but we are getting more and more drove wells every year 40 to 194 feet deep.

PAINESVILLE—DR. D. J. MERRIMAN, H. O.

Population 6,000.

1. Incomplete sewer system and water supply.

2. Lack of funds. Water question in United States Court.

3. Yes; with few exceptions

4. None.

5. None.

6. (a) No, except in outside limits
(b) No.
(c) No.

7. No.

8. (No answer.)

9. Scarlet fever, 1 case, 1 death; measles, 153 cases.

PATTERSON—JOHN C. GARDNER H. O.

Population 300.

1. Hog pens, manure heaps and privy vaults.

2. Only that of neglect on the part of board of health to make appropriations for such work and services required.

3. No.

4. That there was no need of a board of health and a refusal to pay expenses at times, especially to send delegates to annual meetings.

5. Only that if there is no fine attached to the law requiring monthly meetings there should be.

6. (a) Yes.
(b) We have none.
(c) We have none.

7. (No answer)

8. Have none.

9. (No answer)

REMARKS: We had no deaths from contagious diseases in our village the past year. Our village is not very compactly built, but houses far apart so that some of the defects I spoke of would not perhaps be accounted as of much detriment to health.

PEEBLES—JAS. W. YANKIE, H. O.

Population 850.

1. Bad drainage and water closets. Seemingly they have caused no epidemics or serious inconveniences except bad odors and much mud.

2. We have remedied some and are endeavoring to get the town in better condition, but progress is slow.

3. No.

4. None exist.

5. I think our state laws are adequate if carried out.

6. (a) Yes.
(b) No.
(c) None.

7. No regular dairies within corporate limits.

8. No.

9. Diphtheria, 3 cases; typhoid fever 8 cases.

PEMBERVILLE—JOHN SKILES, SR, H. O.

Population 1,700.

1. Boxes above ground in the majority of water closets. Drawing swill and rubbish of any

kind in streets or alleys. Permitting creamery and hog yards in town.

2. Afraid to hurt some customers' feelings through the members of the board of health.

3. No: five meetings in all, and these by hard work by me. Last meeting held September 17.

4. No; the board of health did nothing to get into difficulties.

5. That the health officers in each county should meet at least once each year, for mutual protection and receiving valuable information by comparing notes.

6. (a) Yes.
(b) No.
(c) A creamery. Yes.

7. No; without help from board of health could not be done.

8. No.

9. Typhoid fever, 2 cases.

PERRYSBURG—DR. J. H. RHEINFRANK, H. O.

Population 2,000.

1. Lack of sewerage.

2. The village council will do nothing to correct the defect.

3. Yes.

4. The council will do nothing and if the board of health has anything done it is an endless job to get the bills paid, consequently there is a continual jangle going on.

5. A law to make every council and township trustees levy a certain tax every year for the use of the board of health would be a great help. The money to be paid on the order of board of health without action by the council.

6. (a) No.
(b) No.
(c) No.

7. No.

8. No.

9. Diphtheria, 6 cases, 2 deaths; typhoid fever, 7 cases, 1 death.

PIKETON—A. E. BUMGARNER, H. O.

Population 1 000.

1. No sanitary defects.

2. (No answer.)

3. The rules and regulations provide for monthly meetings, but are held as necessitated by special questions.

4. None.

5. (No answer.)

6. (a) Yes.
(b) Yes.
(c) (No answer.)

7. The cows furnishing milk are in private families and in good condition generally.

8. (No answer.)

9. (No answer)

REMARKS: The health of our village for the past year has been remarkably good. Nothing infectious having been reported other than some little whooping cough and influenza.

PIONEER—W. H. DURBIN, H. O.

Population 500.

1. A crooked little stream running through corporate limits, and allowing a creamery to run under a business house with steam engine, and allowing the offals or washings of said creamery to be ditched into the above stream.

2. The stream should be straightened, all brush and rubbish cleaned from channel and banks. None only for fear of offending the man who runs the creamery, and through whose premises the stream runs.

3. We have.

4. None in particular, but we think the council ought to back up the board more strenuously.

5. Have not.

6. (a) Yes.
(b) None.
(c) One creamery; no dairies

7. Milk dairy one mile from the village; do not.

8. Do not.

9. Scarlet fever, 2 cases.

REMARKS: The health of our village during the past year has been remarkably good. All deaths have been aged people.

PIQUA—DR. W. N. UNKEFER, H. O.

Population 12,000.

1. There is none; we have good sewerage system.

2. No.

3. (No answer.)

4. None.

5. Not at present. We have enough laws, but to enforce them is the trouble.

6. (a) No.
(b) No.
(c) No.

7. Yes.

8. Yes.

9. Scarlet fever, 2 cases; typhoid fever, 8 deaths, not reported.

PLEASANT RIDGE—F. D. ACOMB, H. O.

Population 1,250.

1. No means of garbage disposal: lack of sewerage provision; regulation of location and construction of vaults.

2. Opposition to regulations by the public preventing raising of funds. The town is very healthy as a rule, and people do not see the necessity of sanitary precautions.

3. Not regularly, but often have had special meetings. We have had great difficulty in getting citizens to serve on the board.

4. As a rule, council supports the board. Two years ago refused to pay bills for quarantining diphtheria, but came around all right. Sometimes politics interfere a little.

5. I know of nothing at present, except to make boards of health custodian of their own funds, and not compel them to certify to council, which is a great loss of time.

6. (a) No nearer than 150 feet to a dwelling.
   (b) We have not a slaughter-house.
   (c) Yes, we have a number.

7. We are very near Cincinnati, and the Cincinnati board of health exercises a strict supervision over them, as they all sell in the city.

8. No.

9. Scarlet fever, 8 cases; typhoid fever, 6 cases: measles, 5 cases.

RACINE.

Population 500.

1. Drainage good; water good; no serious ones.

2. (No answer.)

3. No.

4. None.

5. No.

6. (a) Yes.
   (b) No.
   (c) No.

7. No.

8. No.

9. Typhoid fever, 2 cases, 1 death; whooping cough, 20 cases.

REMARKS: The case of typhoid fever above referred to did not originate in Racine. They came from Allegheny City, Pa. The party that died came to Racine helpless.

RAVENNA—H. S. JOHNSON, H. O.

Population 5,000.

1. Sewerage system.

2. Simply lack of funds.

3. It has.

4. Financial trouble; the council are trying to curtail expenses, and are beginning at the wrong place—on the board of health.

5. We are agitating the sewerage system. I have nothing to suggest until we get that.

6. (a) We do not.
   (b) We do not.
   (c) We do.

7. We do not, but I think it an oversight.

8. We do not.

9. Diphtheria, 7 cases; scarlet fever 5 cases; typhoid fever, 4 cases, 2 deaths; measles, 4 cases.

REMARKS: Is the undertaker's certificate of death compulsory? Is the physician's certificate compulsory? Does the undertaker have to have a permit to bury in the corporation? Some of our physicians think it is asking too much of them, and our undertaker refuses to obtain a permit to bury in the corporation. How do we know what is being buried here?

READING—SAM. SCHIERLOH, H. O.

Population 8,500.

1. Hog pens and privy vaults.

2. Waiting for spring when we will have a general inspection.

3. Yes.

4. None whatever.

5. To make it absolutely compulsory for quarantining diphtheria, and strict isolation to all persons in the house.

6. (a) If kept in a clean condition.
   (b) Yes.
   (c) No.

7. Yes; twice a year we examine the dairies.

8. No.

9. Diphtheria 61 cases, 11 deaths; typhoid fever, 2 cases, 1 death; measles, 17 cases.

REMARKS: I think the law regulating diphtheria cases should be more stricter, as I believe it would be a blessing to humanity.

RENDVILLE—DR. S. S. JORDAN, H. O.

Population 1,000.

1. Not any of special notice.

2. There is some complaint because we have no board of health.

3. Not since my resignation.

4. There was none—only my compensation was not enough for my trouble.

5. I firmly believe that a health officer should receive some pay to balance the trouble and abuse which is pushed upon him.

6. (a) To a limited extent.
(b) No.
(c) No.

7. Such is not necessary here.

8. No.

9. Diphtheria, 1 case; scarlet fever, 1 case, 1 death; typhoid fever, 2 cases; whooping cough, 2 cases.

REPUBLIC—H. V. BISHOP, H. O.

Population 600.

1. Pig pens and privies.

2. (No answer.)

3. Have had monthly meetings regular except one month.

4. The nature of the trouble between council and board is in regards to payment of a bill certified to the council for payment, for abating nuisance ordered by the board of health.

5. None.

6. (a) Yes.
(b) Yes.
(c) None.

7. Have no dairy stables.

8. We have no dairymen selling milk here.

9. Typhoid fever, 1 case.

ROSEVILLE—O. M. NORMAN, H. O.

Population 1,500.

1. Water and a lack of proper drainage.

2. A lack of finance. The place is poor for the amount of population.

3. Not every month.

4. We had some difficulty in reference to expense incurred, where a few cases of scarlet fever were quarantined, but was settled.

5. I think of none at present.

6. (a) Yes, but think they should not be.
(b) No.
(c) No.

7. No.

8. No.

9. Scarlet fever, a few cases; typhoid fever, 4 cases; measles, several; whooping cough, quite a number.

SABINA—J. L. JOHNSON, H. O.

Population 1,800.

1. The water used mostly from shallow wells without boiling. The creek running through the village in dry seasons ceases to flow and leaves stagnant pools in the corporate limits.

2. We have no water works and it seems impossible to exist without water.

3. They meet during winter months at the call of the secretary and every two weeks during balance of year.

4. None.

5. None now.

6. (a) During fall and winter.
(b) One.
(c) None.

7. Nearly all our milk supply is obtained from private citizens.

8. No.

9. Scarlet fever, 1 case; typhoid fever, 2 cases, 1 death.

REMARKS: Scarlet fever, whooping cough, mumps and measles we quarantine the little folks but not the adults. Diphtheria we quarantine the house and disinfect as soon as they recover.

SANDUSKY—DR. C. EUGENE STROUD, H. O.

Population 24,000.

1. Sewers that have but little fall in eastern portion of the city.

2. The lay of the land is very low.

3. (No answer.)

4. No.

5. No.

6. (a) Only a limited number in a portion.
(b) At extreme limits.
(c) Only a few, well out.

7. Very often.

8. Yes.

9. (No answer.)

ST. BERNARD—DR. S. B. HOWARD, H. O.

Population 2,800.

1. We have no defects.

2. (No answer.)

3. Yes.

4. No.

5. No.

6. (a) 200 feet from any dwelling; only two.
(b) No.
(c) Yes.

7. Yes, inspect dairy stables.

8. No.

9. Diphtheria, 4 cases, 1 death; typhoid fever, 6 cases, 1 death.

REMARKS: We have had very little infection and the village is in good sanitary condition.

SAINT PARIS—DR. C. A OFFENBACHER, H. O.

Population 1,400.

1. Water closets, privy vaults, hog pens and saloons.

2. Lack of energy and a vigorous prosecution.

3. No.

4. None.

5. None.

6. (a) Yes.
(b) There are none in corporation.
(c) None.

7. Rules require it, but have not been enforced.

8. Rules require it.

9. Scarlet fever, 14 cases, 1 death; typhoid fever, 8 cases, 1 death.

REMARKS: Board just recently reorganized; think we have a good working board now; will probably do some effective work.

SALEM—DR. F. T. MILES, H. O.

Population 8,000.

1. Want of sewerage and good water.

2. The board has repeatedly asked the city council to take action on above matter, but never received a reply. The people are very much in favor of a sewerage system.

3. Yes.

4. No.

5. No.

6. (a) No.
(b) No.
(c) No.

7. We are just printing standing orders of board of health that include such examinations and inspections.

8. (No answer.)

9. Diphtheria, 5 cases; scarlet fever, 19 cases, 1 death; typhoid fever, 30 cases, 4 deaths; measles, 1 case.

SALINEVILLE—WM. CARNAHAN, H. O.

Population 3,000.

1. I considerate it pretty good.

2. The reason is the council has no money.

3 Yes.

4. There have been none.

5. I have none.

6. (a) Yes, with permit.
(b) There are none.
(c) There are none.

7. No, there are no dairy stables and the citizens get milk for their own use from people that have cows.

8. No.

9. Typhoid fever, 18 cases, 3 deaths.

SCOTT—F. W. BEAMER, H. O.

Population 800.

1. Hog pens and privy vaults and J. T. Scott's fish pond.

2. The village council fails to take action.

3. Yes.

4. Failing to take action on the sanitary defects mentioned.

5. None.

6. (a) Yes.
(b) No.
(c) Yes.

7. No.

8. No.

9. Scarlet fever, 1 case; typhoid fever, 3 cases.

SENECAVILLE—DR. W. SCOTT, H. O.

Population 500.

1. Several privies and hog pens that were built over a running stream were ordered removed. Privies and hog pens are not cleaned and disinfected as often and thoroughly as they should be.

2. None, except to have it at owners' expense after notifying them.

3. No.

4. None.

5. No.

6. (a) Yes.
(b) Yes.
(c) There are no dairies.

7. No.

8. No.

9. Diphtheria, 1 case; scarlet fever, 4 cases; typhoid fever, 2 cases.

SEVILLE—DR. PLATT E. BEACH, H. O.

Population 1,000.

1. The construction of privy vaults and the use of shallow wells.

2. "Hard to teach an old dog new tricks."

3. Occasionally.

4. None.

5. The State Board of Health should compel towns of 1,000 and over to discontinue the use of shallow wells and build water works.

6. (a) No.
(b) No.
(c) No.

7. No.

8. No.

9. Typhoid fever, 30 cases, 3 deaths.

SHELBY—DR. W. S. ANDERSON, H. O.

Population 2,500.

1. Privies built previous to the establishment of the board, and not having drawers or water-tight vaults. The creek running through the town into which all kinds of filth are drained.

2. No ordinance covering first named defect.

3. No.

4. None to my knowledge.

5. (No answer.)

6. (a) Yes, when not closer than 100 feet to any dwelling or place of business.

(b) No.
(c) No.

7. No.

8. No.

9. Diphtheria, 17 cases, 6 deaths; scarlet fever, 2 cases; typhoid fever, 60 cases, 8 deaths; measles, 1 death.

REMARKS: Cases of measles were not quarantined. This was because so many cases broke out simultaneously that the whole town was infected by cases that were not treated by any doctor, and consequently there was no way of finding them out.

SHERWOOD—DR E. J. POTTER, H. O.

Population 600.

1. Neglect in gathering up garbage and keeping privy vaults clean. However, no complaints have been made, except in one case, which was attended to on notice.

2. Health department to lenient.

3. Not regular during cold weather.

4. None whatever.

5. No.

6. (a) Yes.
(b) No.
(c) None here.

7. No.

8. No.

9. Typhoid fever, 4 cases, 1 death.

SHREVE—C. H. LILLEY, H. O.

Population 1,100.

1. We have at present no bad sanitary defects in our village, but find the chief complaint arising from privy vaults and on up to last fall the numerous hog pens gave us trouble.

2. There are no reasons for letting these remain, and since our board has taken action a good many have been cleared up.

3. Yes.

4. There has been no trouble between the board of health and council.

5. Nothing to offer in that regard, only that I think it would be better especially for the smaller towns if health officers be advised how to go about cleaning up privy vaults and rubbish, etc.

6. (a) Not within a certain distance from a residence.
(b) No.
(c) We have no dairies.

7. Have had no occasion as we have no dairymen.

8. (No answer.)

9. Measles, several cases.

SIDNEY—DR. EDWIN LEFEVRE, H. O.

Population 6000.

1. Want of sewerage and a bad water supply. Prospects are that both these defects will be removed during the current year.

2. None except that the "powers that be" have been slow to move.

3. Not every month.

4. None.

5. Health officer should be a physician appointed on examination and receive better pay and give more time to the work.

6. (a) No.
(b) No.
(c) None.

7. Yes.

8. No.

9. Diphtheria, 2 cases; scarlet fever, 28 cases; typhoid fever, 26 cases, 7 deaths; measles, 4 cases, whooping cough, 9 cases, 2 deaths.

SMITHFIELD—Dr. W. H. Wood, H. O.

Population 650.

1. We have a few hog pens in the village but as a rule we think the sanitary condition of our town is good.

2. The hog pens and stables as a rule are situated at the lower end of the lots (our town lying on a ridge) and the drainage is away from the dwellings.

3. No.

4. No.

5. (No answer.)

6. (a) According to the location we do, or not.
(b) No.
(c) No.

7. No.

8. No.

9. Scarlet fever, 3 cases; typhoid fever, 1 case.

Remarks: We have been unusually free from contagious diseases during the past year. On the 15th of December we quarantined against Martin's Ferry, Bridgeport and West Wheeling on account of small pox prevailing there and had a special officer to watch for suspicious persons hailing from those places.

SMITHVILLE—Simon Brenneman, H. O.

Population 550.

1. Our village seems to be in a good sanitary condition.

2. (No answer)

3. No.

4. Have had no difficulties in that respect.

5. I think undertakers should be educated to a higher plan and should be required to pass examination same as medical practitioners.

6. (a) Yes, but must be kept clean.
(b) Yes, but must be isolated.
(c) None in town.

7. No, there are a great many of our citizens who keep their own cows and furnish milk for their own use and for immediate neighbors.

8. Have no dairymen or milk venders.

9. Typhoid fever, 3 cases; measles, 3 cases, 1 death.

SOUTH BROOKLYN—R. E. STICKNEY, H. O.

Population 1,000.

1. Our village is in a good sanitary condition.

2. (No answer;

3. Yes.

4. There are no difficulties.

5. No.

6. (a) Are allowed by the board of health under their rules.
(b) Rules the same as hog pens.
(c) We have not many dairies in operation.

7. We do not.

8. We do not.

9. Scarlet fever, 3 cases; typhoid fever, 13 cases; whooping cough, 11 cases.

SOUTH CHARLESTON—Dr Thos. G. Farr, H. O.

Population 1,100.

1. Inefficient sewerage; scarcity of water for flushing purposes.

2. Disinc ination of board of health and council to spend the required amount of money.

3. No.

4. No difficulties have arisen.

5. No.

6. (a) Yes, from October to April, inclusive.
(b) No.
(c) Yes

7. No.

8. No.

9. Scarlet fever, 6 cases.

SPENCERVILLE—Dr. J. C. Pence, H. O.

Population 1,800.

1. Lack of drainage.

2. No convenient outlet.

3. Yes.

4. None.

5. The appropriation of funds for monthly bulletins as issued heretofore.

6. (a) No.
(b) No.
(c) No.

7. No.

8. No.

9. Scarlet fever, 1 case; typhoid fever, 10 cases, 2 deaths.

SPRINGBORO—James B. Haines, H. O.

Population 500.

1. Water and night soil.

2. Difference of opinion between council and board of health.

3. Yes.

4. There was trouble on account of the water supply, but was compromised by council sinking a public well. Said well is 64½ feet deep.

5. (No answer.)

6. (a) Yes, they must be kept clean.
(b) No.
(c) No.

7. No.

8. No.

9. Scarlet fever, 4 cases; typhoid fever, 1 case, 1 death; whooping cough, 24 cases.

SPRINGFIELD—Dr. Henry H. Seys, H. O.

Population 38,000.

1. (a) Uncemented privy vaults, fouling soil and contaminating wells.

(b) Lack of sewers.

(c) Incomplete extension of water mains, compelling many families to depend on wells, largely corrupted by leakage from privy vaults, for drinking water.

2. (a) Ignorance and indifference on the part of the people and city authorities.

(b) and (c) Lack of funds and desire to keep down taxes.

3. The board of public affairs is ex officio the board of health, and meet weekly.

4. None have arisen.

5. Believe it would be better, all things considered, if there was a board of health distinct from the board of public affairs.

6. (a) No.

(b) Yes, after some trouble with them in compelling cleanliness, have had no complaints for two or three years.

(c) Know of none inside of city limits.

7. No provision has been made for such examination and inspection, which would entail a large amount of labor, inasmuch as the dairies are scattered over an area of not less than ten or twelve miles square.

8. No.

9. Diphtheria, 19 cases; membranous croup, 1 death; scarlet fever, 57 cases; typhoid fever, 21 deaths; measles, 190 cases.

Remarks: The fatal case of membranous croup is included in the nineteen cases of diphtheria reported. The fact that in the total number reported there has been but the one death, is conclusive evidence that some of the cases were probably some other form of throat disease.

No attempt has been made to obtain a report of the number of non-fatal cases of typhoid fever, because of the marked difference among physicians as to diagnosis. For this reason it is fair to assume that the number of deaths from this disease should be larger than is reported, because probably many cases called typhoid malarial, malarial, intermittent, typhoid pneumonia, etc., were true typhoid.

So far as can be learned nearly, if not all, the cases of this disease were amongst those who habitually drank well water.

So large a per cent. of cases of whooping cough never are seen by a physician, and as any report as to number would therefore be very inaccurate, no attempt has been made to enforce the law as regards this disease.

STEUBENVILLE—Lyman Priest, H. O.

Population 13,000.

1. (No answer.)

2. (No answer.)

3. Yes.

4. (No answer.)

5. (No answer.)

6. (a) No.
(b) No.
(c) Yes.

7. No.

8. No.

9. Diphtheria, 9 cases; scarlet fever, 113 cases, 1 death; typhoid fever, 41 cases.

STOCKPORT—M. C. Riley, H. O.

Population 700.

1. In my opinion, privy vaults are the worst.

2. Lack of action on the part of board of health.

3. No.

4. No trouble.

5. (No answer.)

6. (a) Yes.
(b) Yes.
(c) None.

7. No.

8. No.

9. Typhoid fever, 4 cases, 2 deaths.

SUMMERFIELD—John E. Moseley, H. O.

Population 600.

1. Privy vaults and hog pens.

2. The council will not pass an ordinance to stop keeping hogs in the corporation, as they keep them.

3. No.

4. No trouble.

5. No.

6. (a) Yes.
(b) Yes.
(c) No.

7. No; our people mostly have their own cows.

8. There are no dairymen here.

9. Whooping cough, 3 cases.

SYCAMORE—R. S. GALLEHER, H. O.

Population 1,000.

1. Our village is in very fair sanitary condition.

2. (No answer.)

3. Not every month.

4. Everything has been satisfactory and harmonious during the past year

5. Some law that would compel boards of health to enforce what laws we already have.

6. (a) Under restrictions, yes.
(b) No.
(c) We have none.

7. Only on complaint.

8. We do not, because they are well known.

9. Typhoid fever, 3 cases; measles, about 100 cases, 1 death; whooping cough, 20 cases.

REMARKS: While we have had quite a number of cases of measles, there was only one death reported, almost all occurred early in the fall, and parents seemed willing that their children should have them, as the weather was fine; consequently the schools were not closed, and not unfrequently did children break out with measles in school, but all got well, and at present their are no cases.

SYLVANIA—GEO. A. CRANDALL, H. O.

Population 600.

1. Hog pens. Hogs are fed on garbage brought from Toledo.

2. We have only two members on board of health, they are farmers and interested in hogs.

3. No; have not but three times since April last.

4. None.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) Yes.

7. No.

8. No.

9. Scarlet fever, 3 cases.

THORNVILLE—W. T. STEVENS, H. O.

Population 600.

1. (No answer.)

2. (No answer.)

3. Meetings are called by chairman.

4. (No answer.)

5. (No answer.)

6. (a) Yes.
(b) None.
(c) None.

7. No.

8. (No answer.)

9. (No answer.)

REMARKS: We have had no contagious diseases in the incorporate limits last year; very healthy in this locality.

TIFFIN—DR. J. BRIDINGER, H. O.

Population 14,000.

1. The only sanitary defect has been the river during dry summer months on account of sewage emptied into the stream, and it was largely remedied last season.

2. No particular reason, think all will be fixed ere long.

3 During winter, from now on, two meetings; during June, July, August and September, every Wednesday.

4 None for several years; work in harmony.

5. Know of none just at present.

6. (a) Must be 150 feet from any building, virtually excludes them.

(b) Only to kill. Cooking and rendering done outside.

(c) Several in outskirts.

7. Yes; and are very strict in this matter. Make frequent inspections.

8. Yes.

9. Diphtheria, 40 cases, 16 deaths; scarlet fever, 4 cases; typhoid fever, 4 deaths.

REMARKS: We have not had typhoid fever reported so far above, only what died; but we have not had many cases last year.

TIPPECANOE CITY—WM STRADER, H. O.

Population 1,500.

1. None.

2 (No answer)

3. Yes.

4. None. Council pays all bills promptly.

5. None.

6. (a) Yes; under restrictions.
(b) Yes; under restrictions.
(c) None.

7. No.

8. No.

9. Typhoid fever, 9 cases.

TOLEDO—Dr. J. T. Wood, H. O.

Population 122,000.

1. Defective sewerage of some portions.

2. The great difficulty, if not impossibility, of sewer construction.

3. Yes; bi-monthly.

4. (No answer.)

5. (No answer.)

6. (a) Only in remote places, on farms.
(b) No.
(c) No.

7. No; this duty is assigned the appointed milk inspector.

8. No.

9. Diphtheria, 53 cases, 15 deaths; scarlet fever, 215 cases, 7 deaths; typhoid fever, 40 deaths; measles, 90 cases; whooping cough, 5 deaths.

Remarks: Reports not complete, and only deaths accurate.

TONTOGANY—R. J. Collin, Mayor.

Population 400.

1. Everything is looked after carefully.

2. (No answer.)

3. No; did not think it necessary to meet. Our town is one of the healthiest in the county.

4. None.

5. (No answer.)

6. (a) There are a few, but looked after very carefully.
(b) No.
(c) No.

7. Yes.

8. No.

9. (No answer.)

Remarks: We have had a few cases of scarlet fever, but very mild; the general health of the town is excellent. There are only a few cows kept in town and they are looked after carefully. The manure piles are kept very low, and privies have all been cleaned out; not much garbage laying around.

TUSCARAWAS—Dr. C. D. Kurtz, H. O.

Population 500.

1. A few bad water closets and hog yards.

2. The board of health has been making an effort to have them cleaned up, with only partial success.

3. Only a part of the time.

4. The council refused to appoint two new members on the board of health, to take the place of those whose time had expired, saying that a board of health was not necessary.

5. None.

6. (a) Yes.
(b) No.
(c) A few families keep cows.

7. No.

8. No.

9. Scarlet fever, 1 case; measles, 1 case.

UHRICHSVILLE—Dr. J. E. Groves, H. O.

Population 4,500.

1. If our sewer system was completed I think our sanitary condition would be very good.

2. The financial condition of our village.

3. They have missed few, if any, regular meetings, and have held many specials.

4. The relations between board and council have been very harmonious.

5. (No answer)

6. (a) Between the 1st of October and the 1st of March.
(b) None
(c) None.

7. No.

8. No.

9. Diphtheria, 3 cases, 2 deaths; scarlet fever, 3 cases, 1 death; typhoid fever, 25 cases, not all reported, 6 deaths

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UNION CITY—Dr. B. K. Snodgrass, H. O.

Population 1,500.

1. No garbage land has been bought by the city, so we have no dumping ground. Sewer pipes are too small.

2. Council opposes sanative measures to some extent.

3. No; but about every two months.

4. On removal of filth of a privy, but the parties finally did the work.

5. Ask every corporation to buy garbage ground.

6. (a) Yes.
   (b) No.
   (c) No.

7. No.

8. No.

9. Typhoid fever, yes, 2 deaths.

UPPER SANDUSKY—Dr. O. C. Stutz, H. O.

Population 3,800.

1. Privy vaults

2. Times too hard to build vaults recommended by board of health.

3. No.

4. None.

5. No.

6. (a) No.
   (b) No.
   (c) Are all in country.

7. No; all live in country.

8. (No answer.)

9. Diphtheria. 7 cases; measles, had about 300 cases.

Remarks: Two deaths from membranous croup. I have treated in all 7 cases of diphtheria with antitoxin (Behring's). All recovered.

URBANA—Dr. H. C. Houston, H. O.

Population 8,000.

1. Lack of sewerage.

2. Lack of money and a large municipal debt.

3. No.

4. Board passed an ordinance forbidding hogs being kept in city limits, which council endeavored to make null and void. council objected also to paying salaries of officers of board, but were obliged to do so.

5. (No answer.)

6. (a) No.
   (b) No.
   (c) No.

7. No; have never had any complaints.

8. No.

9. Diphtheria, 2 cases; scarlet fever, 6 cases; typhoid fever, 38 cases, 10 deaths; whooping cough, 67 cases.

UTICA—Dr. G. W. Garrison, H. O.

Population 1,000.

1. We have two nuisances in our village—Baltimore and Ohio shipping pens for live stock and weighing scales at south end of town—where they allow stock to be corralled until ready for loading on cars, usually a day or two.

2. Because owned by large corporation, with lots of money back of them.

3. Yes.

4. None since my appointment, July 1, 1896.

5. (No answer.)

6. (a) Yes.
   (b) No.
   (c) Yes.

7. No.

8. No.

9. (No answer.)

VANDALIA—Dr. W. H. Riley, H. O.

Population 400.

1. (a) Absence of privy vaults.
   (b) Improper drainage.

2. A lack of interest in having an active board of health.

3. No.

4. There has been no difficulty. The chief trouble is that citizens who are appointed on board of health refuse to qualify or attend meetings.

5. I believe every incorporated village should be compelled to have a board of health.

6. (a) Yes.
   (b) Yes.
   (c) No.

7. No Milk is furnished by families who keep but one cow.

8. No.

9. Diphtheria, 1 case; typhoid fever, 2 cases.

VAN WERT—Dr. E. L. Wilkinson, H. O.

Population 6,000.

1. Want a sanitary system of sewerage. Sanitary sewage runs through drainage sewers that empty into a creek that goes dry in summer months. It has been 26 months since we have had a case of either diphtheria or scarlet fever in town.

2. City is bonded now to the limit permitted by bond buyers.

3. No.

4. None exists.

5. None.

6. (a) Only permits granted by board of health. In thickly settled part of town none are allowed.

(b) Only by permits granted.
(c) Yes.

7. Only when our attention is called to them.

8. No.

9. Typhoid fever not fully reported, 1 death; measles, 13 cases.

REMARKS: I only began last summer to enforce the rule on the reporting of typhoid fever, and I find so much "carelessness" in diagnosing such cases that it is difficult to arrive at correct results. However, I think our town did not have over six cases of typhoid fever during the year 1895. Having no sanitary sewerage system and also no scarlet fever or diphtheria for 26 months is rather remarkable to say at least.

VERMILLION—HENRY SCHMOLL, H. O.

Population 1,500.

1. None at present.

2. (No answer.)

3. Yes, when we can get them together.

4. None.

5. No.

6. (a) Yes.
(b) No.
(c) Yes.

7. Yes, occasionally.

8. No.

9. (No answer.)

VERSAILLES—DR. WM. H. RIKE, H. O.

Population 1,500.

1. A considerable portion of the village water supply is from shallow wells (10 to 20 feet) which in a dry season become dry or only furnish a meager supply of water.

2. The village is not financially able to furnish proper water works.

3. No. No quorum frequently.

4. None.

5. None.

6. (a) Yes.
(b) No.
(c) We have none.

7. Yes. The only dairyman lives a mile away from corporate limits. Health officer has frequently inspected the dairy.

8. No.

9. Typhoid fever, 35 cases, 1 death.

REMARKS: The number of cases of typhoid fever is as reported by the physicians, but in opinion of health officer ten of these were not typhoid fever.

WADSWORTH—DR N. S. EVERHARD, H. O.

Population 2,000.

1. The water supply is from springs into which surface water drains from even slight rains. The dependent parts of the water pipes are continually filled with foul sediment. Sewer pipes from houses drain to open gutters in the street.

2. In the first case nothing has been done to prevent. In the second instance the ordinance is not enforced.

3. I think so.

4. I think none.

5. No.

6. (a) No.
(b) No.
(c) No.

7. No.

8. No.

9. (No answer.)

WAPAKONETA—A. KAHLER, H. O.

Population 4,400.

1. The Auglaize river, a stream which runs through the village from east to west, with many crooks and turns.

2. We have no funds to use for straightening said stream.

3. We meet twice a month during the summer and in the winter whenever necessary.

4. None whatever.

5. I have not.

6. (a) We do allow hog pens.
(b) No.
(c) Some on a small scale.

7. We do not.

8. We do not.

9. Diphtheria, 16 cases, 8 deaths; typhoid fever, 3 deaths.

REMARKS: During the past year this board held seventeen meetings, and issued twenty-two notices to abate nuisances; issued sixty-three burial permits; recorded eighty-five births—of these forty-nine were males and thirty-six females; total number of deaths during year were sixty-three—of these thirty-nine were males and twenty-four were females, ten under one year, ten between one and ten, seven between ten and twenty, twelve between twenty and forty, nine between forty and sixty, twelve between sixty and eighty, and three over eighty The total expense of this board for the year was $170.70; o

this sum $110.20 were expended for quarantining and taking care of diphtheria patients; $61.50 were expended for blanks, letter paper, envelopes and fees for sanitary police and clerk and health officer.

WARREN—DR. M. L. WILLIAMS, H. O.

Population 8,000.

1. Mouth of sewer in center of city.

2. Has been condemned by board and council. We are going to make a change this season.

3. Yes.

4. None.

5. (No answer.)

6. (a) No.
   (b) No.
   (c) No.

7. Yes.

8. Yes.

9. Diphtheria, 6 cases, 4 deaths; Scarlet fever, 18 cases; typhoid fever, 8 cases, 5 deaths: measles, 62 cases; whooping cough, 12 cases.

WASHINGTON, C. H—J. M. EDWARDS, H. O.

Population 7,121.

1. Want of sewerage.

2. Financial inability.

3. Meet at call of president.

4. Entire harmony except that the council levy no tax for sanitary purposes.

5. The law is perhaps good enough if better obeyed. Yes; the legislature should fix health officers' salaries. Salaries should be graded according to population.

6. (a) No.
   (b) No.
   (c) One in corporation.

7. Examine stables and cows. No milk inspector.

8. No.

9. Diphtheria. 35 cases, 7 deaths; typhoid fever, 6 cases, 3 deaths; measles, 1 case.

WASHINGTONVILLE—DR. JOHN C. GORSUCH, H. O.

Population 1,500.

1. The involuntary disposition on the part of many to keep privy vaults thoroughly cleaned. The existence of hog pens. Contamination of water from extraneous sources and the lack of having wells cleaned as often as they should be. Absence of street sprinklers in the hot season.

2. Partly apathy and partly lack of financial resources to have things otherwise.

3. Meet regularly monthly.

4. Desire to say that the mayor and council have given their hearty co-operation in matters pertaining to the board of health.

5. Legislation in favor of boards of health would be best secured by sending a few more physicians to the General Assembly.

6. (a) Yes.
   (b) No.
   (c) No.

7. No.

8. No.

9. Scarlet fever, 1 case; typhoid fever, 10 cases; 1 death; whooping cough, 2 cases,

WATERVILLE—DR. SAMUEL DOWNS, H. O.

Population 800.

1. Lack of sewerage.

2. The people think our natural advantages are sufficient and are not willing to be taxed for the improvement.

3. Yes.

4. There have been none.

5. In places of 1,500 or 2,000 inhabitants and under, place all the powers and duties required of boards of health in the hands of council.

6. (a) Yes.
   (b) Yes.
   (c) We havn't any here.

7. No.

8. No.

9. Measles, 1 case.

REMARKS: This vicinity is the healthiest in all north-western Ohio and could be improved upon with a little expense on drainage.

WAVERLY—DR. GEO. D. EMMITT, H. O.

Population 1,800.

1. (1) Pollution of our public wells by watering troughs being located at them. (2) Stench arising from hog pens a nuisance which is in course of abatement by a rule just passed by our board excluding the hog after March 1, 1896.

2. None in fact, long usage and personal rights is offered but of course wont stand cross examination.

3. Hardly ever fail.

4. None as yet, but I have doubts as to their support by ordinance in our fight with hog.

5. Health boards should be as free and independent of village councils as possible. Legislation on that line would be good.

(a) At present.
(b) Yes, operated in certain months.
(c) None.

7. Yes.

8. Not as yet.

9. Diphtheria, 4 cases; scarlet fever, 6 cases; typhoid fever, 5 cases, 2 deaths measles, 3 cases.

REMARKS: There have been 103 burial permits issued the past year. There has been quite a change in the sentiment of our people the past year in favor of the board of health, we now find but very little opposition in enforcing the law.

WAYNESFIELD—SILAS MCPHERON, H. O.

Population 600.

1. Privies.

2. None.

3. No.

4. (No answer.)

5. (No answer)

6. (a) Yes.
(b) No.
(c) None here.

7. (No answer.)

8. No.

9. Scarlet fever, 1 case; typhoid fever, 20 cases, 1 death.

REMARKS: We have been unusually free from infectious diseases. The most prevalent diseases are typhoid malarial and lung fevers.

WAYNESVILLE—DR. W. E. OGLESBEE, H. O.

Population 704.

1. Want of sewers.

2. Lack of funds and the contrariness of council.

3. Yes.

4. None.

5. Township and village boards of health should be the same body.

6. (a) Yes, but regulate them as regards cleanliness. Not during summer months.

(b) Yes, but regulate them as regards cleanliness. Not during summer months.

(c) No.

7. Yes.

8. No.

9. Typhoid fever, 3 cases.

WELLINGTON—M W. LANG, H. O.

Population 2,500.

1. The use of water for domestic purposes obtained from wells which in this vicinity are quite shallow, not averaging in depth more than 15 to 18 feet.

2. No particular reason. I am trying to impress this fact upon the minds of all still using well water.

3. (No answer.)

4. Everything is harmonious.

5. (No answer.)

6. (a) Not within 200 yards of residence.
(b) No.
(c) Not if they are a nuisance.

7. Never has been done.

8. No.

9. Scarlet fever, 12 cases; typhoid fever, 6 cases, 3 deaths measles, 6 cases.

REMARKS: While we have had several cases of scarlet fever, they have all been of very mild type. There have been several cases of typhoid-malaria One death was the result of over eating which brought on a relapse.

WELLSTON—R. A. HUTCHISON, H. O.

Population 9,000.

1. Want of pure water and sewerage.

2. Want of money and division of sentiment how to provide a supply of good water.

3. Omitted occasionally in time of general good health and no meeting called for.

4. Nothing of importance. In regard to some items not sufficient funds for the work we deem necessary to be done.

5. (No answer)

6. (a) Yes, but are visited to be kept so as not to be offensive.
(b) Yes, as last named and required to remove offensive matter.
(c) (No answer)

7. No, as there are none kept in the corporate limits.

8. Not to the present.

9. Typhoid fever, 1 case, 1 death.

WELLSVILLE—JOSEPH T. WARREN, H. O.

Population 6,000.

1. Lack of sewerage and impure water. The water is pumped from the river.

2. As to sewerage, lack of funds.

3. Yes.

4. The greatest harmony prevails.

5. No.

6. (a) Emphatically no.

(b) No; and action toward their removal pending.

(c) (No answer.)

7. No.

8. No.

9. Diphtheria, 10 cases, 1 death; scarlet fever, 40 cases; typhoid fever, 20 cases, 3 deaths; measles, not reported to the board.

WEST LIBERTY—R. M. FULWIDER, H. O.

Population 1,300.

1. Improper drainage and hog pens.

2. Council will not rectify one nor prohibit the other.

3. Yes.

4. None.

5. (No answer.)

6. (a) Yes.
(b) No.
(c) No.

7. No.

8. No.

9. Scarlet fever, 1 case; typhoid fever, 1 case.

WEST MANCHESTER—DAVID E. ALLEN, H. O.

Population 400.

1. Contaminated water from privy vaults, although this has been greatly changed for the better since board of health has been in operation. Also surface drainage only. We have no sewer, nor are we likely to have in this small village.

2. Expense and poor outlet for sewers. In case of privy vaults made of cement, they are hard to construct so that they will not freeze and the cement crumble off.

3. Yes, most of the time.

4. Has been none.

5. No; unless they were salaried. I believe this would make them more efficient.

6. (a) Yes, if kept well cleaned, and offal taken away frequently.

(b) No.

(c) There is a creamery within corporate limits, but is no detriment the way kept.

7. We are not supplied with milk from dairies, several persons are keeping one cow, and most of the milk comes from this source.

8. No.

9. Typhoid fever, 2 cases, 1 death.

WEST MILTON—DR. W. H. KESSLER, H. O.

Population 750.

1. Want of underground drainage.

2. Want of sufficient funds. Proper drainage would be very expensive, as the soil depth to underlying rock is but 18 to 24 inches.

3. No; has been impossible to get a quorum. Board very negligent.

4. No.

5. Some legislation compelling members of boards of health to attend meetings.

6. (a) Yes, under restrictions.

(b) Yes.

(c) None.

7. No.

8. No.

9. Typhoid fever, 5 cases.

WESTON—DR. G. B. SPENCER, H. O.

Population 1,000.

1. Lack of proper sewer facilities. Use of privy vaults.

2. No outlet for sewers. Carelessness of owners and lack of something better.

3. No.

4. None.

5. Yes; make the boards smaller in every town below the city grade. Six is too many people to "assimilate" in little towns.

6. (a) Yes.

(b) No.

(c) No.

7. No.

8. No.

9. Scarlet fever, 6 cases; typhoid fever, 3 cases.

REMARKS: Our village has been in a remarkably healthy condition the past year, all the typhoid we have had, have been imported cases. Many of our people are using deep well water (drilled into rock), I ascribe our excellent sanitary condition to this fact. There has not a death occurred in the village in the past year that could be in any manner traced to any unsanitary condition.

WEST UNION—Dr. W. R. Coleman, H. O.

Population 1,200.

1. Water supply and privy vaults. Water supply is mostly from wells which in time of drouth become low and then increase the attacks of malarial and typhoid fever. Vaults are not disinfected as they should be.

2. Water supply can not be well improved without greater expense than the town can afford.

3. No.

4. None.

5. Yes; make health officers' finding as to sanitary matters final, without recourse to mayor or justice.

6. (a) Yes.
(b) Yes.
(c) Yes.

7. No.

8. No.

9. (No answer.)

Remarks: No system of registration of contagious diseases is kept.

WESTWOOD—Henry A. Faber, H. O.

Population 200.

1. No sanitary defects exist. The village lies high and dry with good natural drainage. Our territory is large, five square miles in the corporation limits Cistern (rain) water used mostly, some well water.

2. (No answer.)

3. Yes, last Friday of each month.

4. There is perfect harmony.

5. (No answer.)

6. (a) Yes, under restrictions.
(b) We have no slaughter-house.
(c) Yes, seven.

7. Yes, and all stables of those also who sell their milk elsewhere, only two out of the seven sell milk in the village, the rest take their milk to Cincinnati.

8. No.

9. Diphtheria, 9 cases, 4 deaths; scarlet fever, 3 cases; typhoid fever, 1 case.

Remarks: Section 2119 in places like the suburbs of Cincinnati is unnecessarily burdensome, in some cases five permits are required. Such a case came to my notice only last month. A child having died at Carthage was buried at Bridgetown. Permit from Carthage, Mill creek township, Cincinnati, Westwood and Green township. The section ought to be so amended that a removal permit from the board of health in whose jurisdiction the death occurred and a burial permit from the board of health in whose jurisdiction the cemetery is situated. A provision to be made for the sending of a notice by postal card to each health officer through whose jurisdiction the corpse is to be taken, by the health officer who issues the removal permit.

WILLIAMSPORT—Dr. G. O. Hays, H. O.

Population 660.

1. Old privy vaults that were in use before we had a health board.

2. None; they are away from other dwellings in suburbs.

3. Yes.

4. The council is the board of health.

5. (No answer.)

6. (a) No.
(b) No.
(c) No.

7. We have none.

8. No.

9. Scarlet fever, 6 cases.

Remarks: Our village is the healthiest in all the vicinity, built on the bluff of Deer creek. Water supply excellent. Drinking water obtained mostly from white sulphur spring, which flows 291 gallons per minute. We never have fevers, only where contracted and brought here; we enforce all rules and clean up twice a year alleys, streets, privies, stables and lots.

WINDHAM—H. J. Higley, H. O.

Population 324.

1. Sewerage.

2. On account being very level and lack of water in dry time to flush sewer. (No water works here.)

3. No. The board is negligent and do not take interest enough unless some disease breaks out.

4. Council gave permit to slaughter cattle and hogs in corporation. Health officer stopped the business.

5. Fine members and not give them a chance to resign without consent of board.

6. (a) Yes.
(b) No.
(c) Yes.

7. Yes.

8. No.

9. Not any.

REMARKS: Only two died last year within the corporation, both of old age 84 and 87 years.

WINTON PLACE—JNO. R. FROOME, H. O.

Population 1,200.

1. Want of sewers. However, our village has been and is now remarkably free from diseases of all kinds.

2. We have had no water supply to flush sewers if we had them, but that will be remedied this year as contracts for water are made.

3. Mostly.

4. None, whatever.

5. None.

6. (a) Yes.
(b) Have none, but not prohibited.
(c) Yes.

7. Yes.

8. No.

9. Diphtheria, 1 case; scarlet fever, 1 case, 1 death.

WOODSTOCK—D. P. SMITH, H. O.

Population 400.

1. Bad wells.

2. No reasons.

3. No.

4. None.

5. Stop the shipment of cholera hogs.

6. (a) Yes.
(b) No.
(c) No.

7. Yes.

8. No.

9. Typhoid fever, 5 cases, 1 death.

WOODVILLE—SAMUEL CRAWFORD, H. O.

Population 900.

1. No system of sewerage; no dumping ground for the disposal of filth and garbage.

2. We expect to have these defects partially remedied in the near future.

3. Yes.

4. None.

5. No.

6. (a) Yes.
(b) No.
(c) No.

7. No.

8. No.

9. Typhoid fever, 15 cases, 1 death; measles, 12 cases; whooping cough, 17 cases.

WORTHINGTON—DR. D. H. WELLING, H. O.

Population ——

1. A system of sewerage.

2. Most think the natural drainage sufficient, and the general health being good, do not feel the necessity of it.

3. No, at call of president.

4. None.

5. None.

6. (a) No.
(b) No.
(c) Some cows are kept.

7. No.

8. No.

9. Diphtheria, 2 cases.

REMARKS: The town has been very free from all contagious diseases during the past year.

WYOMING—A. M. VAN DYKE, H. O.

Population 1,800.

1. Want of a complete system of sewers.

2. Want of outlet.

3. If, upon consultation, business requiring the attention of the board, formal sessions were held; if not, the meeting was informal.

4. (No answer.)

5. None.

6. (a) No.
(b) No.
(c) No.

7. No.

8. No.

9. Diphtheria, 9 cases, 2 deaths; scarlet fever, 11 cases; measles 19 cases; whooping cough, 1 case.

REMARKS: There were doubtless many more cases of whooping cough occurring in the village, but as physicians are rarely called they were not officially reported to this office. To some extent possibly the same may be said of measles.

ZANESVILLE—DR. H. T. SUTTON, H. O.

Population 21,100.

1. Lack of proper sewerage.

2. The city council is overcoming our defective sewerage as fast as their funds will permit.

3. Yes, sometimes four or five times a month.

4. No, everything has been thoroughly harmonious.

5. No.

6. (a) No indeed.
(b) No.
(c) No.

7. Yes, and we make an annual inspection of dairy stables and cows.

8 Yes.

9. Diphtheria, 5 cases, 1 death; scarlet fever, 67 families reported, 5 deaths.

ZOAR—DR. CLEMENS EBERIL, H. O.

Population 250.

1. (No answer.)

2. (No answer.)

3. (No answer.)

4. (No answer)

5. (No answer.)

6. (a) No.
(b) (No answer.)
(c) (No answer.)

7. (No answer.)

8. (No answer.)

9. (No answer.)

REMARKS: 1 death, cause heart failure; [illegible] deaths, cause apoplexia.

ANNUAL REPORTS OF TOWNSHIP BOARDS OF HEALTH.

Five hundred and eighty reports were received out of a total of 1,357. 43 per cent.

In answer to question "Has your board been properly organized?" 507 answered yes; 69 answered no; 4 do not answer.

Question 2. How many meetings were held during the year? 181 held 1 meeting; 90 held 2 meetings; 44 held 3 meetings; 42 held 4 meeting; 10 held 5 meetings; 16 held 6 meetings; 62 held more than 6 meetings; and 135 did not answer, or said they had held no meetings. A large number said that sanitary matters were talked of at the regular township meetings, and such business as was necessary, was attended to at these meetings.

Question 3. Are your people generally in favor of maintaining a board of health in the township? 399 answered yes; 97 answered no; 73 have heard no expression of sentiment on the question, and 11 do not answer.

Question 4. Has your board appointed a health officer? 204 answered yes; 164 answered no. In 112 townships the clerk or trustees act as health officers. 100 do not answer.

Question 5. State what compensation is allowed the health officer? In 194 townships the health officer, clerk or trustees are paid per diem for services rendered, ranging from $1 to $3. Physicians from $1 to $2 a trip. In 44 townships the health officers are salaried, ranging from $5 to $100 per year, with an average of $25. 68 pay nothing to the health officer. 274 do not answer.

Question 6. Have physicians, in all cases, reported contagious diseases to your board. 236 answered yes; 203 answered no; 82 report having had no contagious diseases; 59 do not answer.

Question 7. When a case of contagious disease is reported, what measures have been taken by your board to prevent spread of the disease? 303 quarantine; 26 placard the houses; 6 isolate the patient; 245 do not answer.

Question 8. After death or recovery from contagious disease, who looks after disinfection of the house? In 122 townships this is done by the health officer; in 110 by the physician; in 47 by the board of health; in 42 by the family; in 19 by the clerk, and in 4 by the undertaker. 236 made no answer.

Question 9. Does your board require a permit to bring a corpse in or take it from your township? Yes, 211; no, 207. 162 made no answer. Some of those marked "no" require permits in case of contagious disease, but not for other deaths.

Question 10. What nuisances were abated by your board during the year? The greatest number of nuisances abated were caused by dead animals. In most cases the animals were buried by the board of health. Other causes of nuisances were privy vaults, slaughter-houses, hog pens, old weeds, manure piles, etc.

Question 11. Give particulars of any case where it was necessary to go to law to enforce any order or regulation of the board of health. Only 10 townships reported cases where it was necessary to go to law. Eight of these succeeded in convicting. One case, Perry Tp., Wood Co., vs. City of Fostoria, to prevent emptying sewage into East Portage creek is still pending.

Green Tp., Hamilton county.—Four undertakers were fined small amounts. All pleaded ignorance of the law.

Clay Tp., Muskingum county.—A farmer had a number of sheep killed by dogs, which he left without burying. The board served a notice on him to abate the nuisance by burying the carcasses. He then put them in a washout within forty feet of a public road and did not cover them with dirt.

Harrison Tp., Montgomery county.—Smith and Hash, scavengers of Dayton, were arrested for dumping contents of privy vaults on land in Harrison township, were fined $25 and costs, and were compelled to dig trenches three feet deep and bury same. Case brought by T. W. McPherson, sanitary officer.

Oregon Tp., Lucas county.—Killing horses and dressing the meat. Sued the parties and sent them to the stone yard.

Greene Tp., Wayne county.—Refused to obey quarantine laws. (No comment.)

Mecca Tp., Trumbull county.—Board of health against Warren Johnson for disposing of diseased cow to Jos. Casterline. Promptly fined by justice of the peace $25 and costs.

Londonderry Tp., Guernsey county.—A young man arrested December 30, for refusing to be quarantined by health officer. The daughter of the house came from Wheeling, W. Va., where there was small-pox. Board of health served notice, and the man was arrested for disobeying. Pleaded not guilty, and gave bond for $100 to appear January 4. (Nothing later.)

Lexington Tp., Stark county.—A resident of the township made a business of gathering the city garbage and emptying the same on his premises. After frequent notices from the board of health to abate the nuisance, without complying, he was arrested and fined. Failing to pay the fine it was taxed on the property.

Kirkland Tp., Lake county.—One case for selling unhealthy meat. Fined $10 and costs.

One case for the burial of dead horses. Fined $12 and costs.

The money was collected in both cases.

Perry Tp., Wood county.—Suit against city of Fostoria to prevent emptying sewage in East Portage creek. Suit pending.

LIST OF

Municipal Boards and Health Officers.

JANUARY 1, 1896.

CITIES.

Akron	Dr. L. S. Ebright.
Alliance	Dr. Jno. A. Roach.
Bellaire	Dr. D. W. Long.
Bucyrus	Dr. W. A Daugherty.
Canton	Dr. J. F. Marchand.
Chillicothe	Dr. C. S. McCafferty.
Cincinnati	Dr. J. W. Prendergast.
Circleville	Mr. W. F. Tolbert.
Cleveland	Dr. J. L. Hess.
Columbus	Dr. D. N. Kinsman.
Dayton	Dr. A. H. Iddings.
Defiance	Dr. P H. Aldrich.
Delaware	Dr. L. S. Lupton.
East Liverpool	Dr. C. B. Ogden.
Fremont	Dr. O. E. Phillips.
Findlay	Mr. Amos Beardsley.
Fostoria	Mr. J. O. Hess.
Galion	Mr. A. Brokaw.
Gallipolis	Dr. E. Westlake.
Greenville	Dr. A. F. Markwith.
Hamilton	Mr. P. E. Welsh.
Ironton	Dr. J. W. Lowry.
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Middle Point .....
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Pickerington	
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Plainfield	Mr. J. S. Jenkins.
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Pleasant Ridge	Mr. F. D. Acomb.
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Reading	Mr. George Mages.
Rendville	Dr. S. S. Jordan.
Republic	Mr. H. V. Bishop.
Reynoldsburg	Dr. F. G. Taylor.
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Richmond	Dr. Samuel Rothacker.
Richville	
Richwood	Mr. W. M. Wood.
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Ripley	Dr. Jno. P. Tyler.
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Rochester	Dr. George Roberts.
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Rocky Ridge	Mr. Anson Green.
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Royalton	
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Sciotoville	
Scott	Mr. Frank Beamer.
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Senecaville	Dr. W. Scott.
Sekitan (Addystown P. O.)	
Seville	Dr. P. E. Beach.
Seven Mile	
Shane's Crossing (Rockford P. O.)	
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Stoutsville	
Stryker	Mr. George Snyder.
Summerfield	Mr. John E. Mosely.
Summerford	
Sugar Grove	Dr. T. R. Mason.
Sunbury	Dr. G. H. Gerhardt.

Swanton	Dr. A. B. Lathrop.
Sycamore	Mr. R. S. Galleher.
Syracuse	
Sylvania	Mr. Geo. A. Crandall.
Tarlton	Mr. J. B. Grove, Clerk.
Taylorsville (Philo P. O.)	Dr. J. H. Green.
Tippecanoe City	Mr. Wm. H. Strader.
Tiltonville P. O. (Grover)	
Tiro	Dr. W. H. Guiss.
Thornville	Dr. George H. Pugh.
Thurston	
Tontogany	Mr. R. J. Collin, Mayor.
Toronto	Dr. B. F. Collins, Sec'y.
Trenton	
Trimble	Dr. H. D. Danford.
Tuscarawas	Dr. C. D. Kurtz.
Union City (Ind.)	Dr. B. K. Snodgrass.
Uniontown (Fultonham P. O.)	
Unionville	
Unionville Center	
Uhrichsville	Dr. J. E. Groves.
Utica	Dr. G. W. Garrison.
Upper Sandusky	Dr. O. C. Stutz.
Van Buren	
Vandalia	Dr. W. H. Riley.
Vanlue	Dr. Jas. L. Schrotz.
Van Wert	Dr. E. W. Wilkinson.
Vermillion	Mr. Albert Matteson.
Versailles	Dr. W. H. Rike.
Vinton	Mr. Robert B. Carter.
Wadsworth	Dr. N. S. Everhard.
Waldo	Dr. J. R. Hipple.
Wapakoneta	Mr. A. Kahler.
Warsaw	Mr. S. W. Willis.
Washington	Mr. T. W. Hyde.
Washingtonville	Dr. J. C. Gorsuch.
Waterloo	
Waterville	Dr. Samuel Downs.
Wauseon	Dr. G. W. Hartman.
Waverly	Mr. George D. Emmitt.
Waynesburg	Dr. E. G. McCormick.
Waynesfield	Dr. W. S. Turner.
Waynesville	Dr. W. E. Oglesbee.
Webster	Mr. J. F. Byrd.
Wellington	Mr. M. W. Lang.
West Alexandria	Mr. L. J. Ashworth.
West Cairo	Dr. J. S. Clippinger.
West Carrollton	Mr. G. W. Dumer, Mayor.

West Chester	
West Cleveland	Dr. G. A. Ehret.
West Elkton	Dr. Elwood Holaday.
Westerville	Mr. James D. Budd.
Western Star	
West Jefferson	Dr. W. E. Postle.
West Leipsic	
West Liberty	Dr. R. M. Fulwider.
West Manchester	Mr. David Allen.
West Mansfield	
West Middleburg	
West Mill Grove	
West Milton	Dr. W. H. Kessler.
West Salem	Dr. D. W. Carver.
Weston	Dr. G. B. Spencer.
West Union	Dr. W. R. Coleman.
West Unity	Mr. J. H. Tiddler.
West Wheeling	
Westwood	Mr. Henry A. Faber.
Wheelersburg	
White House	Dr. C. H. Ellis.
Wilkesville	Dr. E. M. Dixon.
Williamsburg (Batesville P. O.)	
Williamsport	Dr. G. O. Hayes.
Windham	Mr. H. J. Higby.
Willoughby	Dr. E. G. Clark.
Willshire	Dr. J. K. Ross.
Wilmington	Dr. G. M. Austin.
Winchester	Dr. C. W. Salisbury.
Winton Place	Mr. John R Froome.
Woodsfield	Dr. C. T. Huth.
Woodstock	Mr. D. P. Smith.
Woodville	Mr. Samuel Crawford.
Worthington	Dr. D. H. Welling.
Wyoming	Mr. A. M. Van Dyke.
Yellow Springs	Dr. W. M. Hafiner.
York	— "
Zanesfield	— "
Zaleski	Dr. F. M. Smallwood.
Zoar	Dr. Clemens Breil.

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OF THE

Ohio State Board of Health,

January 1, 1896.

Additions to the Library during 1895.

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ABSTRACT OF REPORTS

... OF ...

Deaths and their Causes

IN THE FOLLOWING CITIES AND
TOWNS IN OHIO

FOR THE

Year ending December 31, 1895.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF JANUARY, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera Infantum.	Cerebro spinal meningitis	Cholera morbus.	Diarrhœal diseases	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases	Total violence.	Premature and still-births.
Akron	27,601	36	15.65	....	....	4	1	....	....	....	....	....	....	....	....	....	....	1	....	6	1	2	22	1	....	....	5	....	4	....	....	3	3	1	3
*Canton	26,189	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chillicothe	11,288	16	17.01	3	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	5	1	3	9	....	....	....	1	....	2	2	....	....	1	2
Cincinnati	296,908	519	20.97	87	58	104	13	1	....	....	7	1	....	....	1	....	....	22	....	102	10	67	93	11	5	36	11	16	30	20	....	59	44	11	55
Cleveland	261,353	433	19.89	92	68	93	13	....	2	....	....	....	1	1	....	....	54	....	7	1	66	14	38	212	7	10	16	42	12	25	12	1	58	44	13	41
Columbus	88,150	128	17.43	20	19	15	10	....	....	....	....	....	....	....	....	....	1	....	2	....	29	4	20	61	6	1	2	5	3	7	6	....	16	8	8	8
Dayton	61,220	116	22.74	29	12	26	7	....	....	....	....	....	....	....	....	....	1	....	2	....	17	5	10	48	....	....	2	6	3	3	....	....	12	7	4	13
East Liverpool	10,956	25	27.38	1	1	9	1	....	2	....	....	....	1	1	....	....	....	....	2	....	3	....	3	9	....	1	....	3	....	1	....	....	4	2	2	....
Findlay	18,553	20	12.94	6	4	7	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	8	....	....	....	....	....	1	....	....	6	3	1	....
Hamilton	17,565	31	21.18	8	4	3	2	....	1	....	....	....	....	....	....	....	....	....	....	....	8	3	3	18	....	2	....	1	....	3	2	....	2	2	....	1
Ironton	10,939	23	25.23	7	4	6	....	....	....	....	1	1	....	....	....	....	3	....	....	....	3	....	3	11	1	1	1	1	....	..	....	....	2	2	1	2
*Lima	15,981	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Mansfield	13,473	9	8.01	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	1	2	....	....	....	1	....	....	....	....	....	1	1	1
Massillon	10,092	8	9.51	....	....	5	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	....	....	1	....	1	....	....	....	....	....	....
Newark	14,270	20	16.82	4	3	4	1	....	....	....	....	....	....	....	....	....	....	....	3	....	3	1	1	9	1	....	....	....	....	2	1	....	5	2	2	3
Portsmouth	12,894	17	16.46	6	1	2	....	1	....	....	1	....	....	....	....	....	....	....	....	....	1	....	1	13	1	2	3	....	....	3	1	....	3	....	1	1
Sandusky	18,471	13	8.44	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	2	....	2	9	1	....	....	....	....	....	....	....	3	....	1	1
Springfield	31,895	42	15.80	8	1	8	....	....	....	....	....	1	....	....	....	....	....	2	....	....	8	1	7	23	3	2	1	1	1	5	....	....	4	8	....	4
Steubenville	13,394	15	13.44	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tiffin	10,801	9	10.00	....	....	5	4	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	2	1	....	....	....	....	....	....	....	1	2	....	....
Toledo	81,434	106	15.62	15	13	7	2	....	2	....	....	....	....	....	....	....	....	1	....	....	22	3	14	46	1	1	3	6	3	3	2	....	10	24	7	12
Youngstown	33,220	45	16.13	11	8	5	1	....	....	1	....	1	....	....	....	....	....	....	....	....	7	1	5	29	....	....	1	2	2	4	....	....	10	4	....	3
Zanesville	21,009	38	21.70	1	2	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	9	2	6	23	2	....	1	....	3	5	2	....	2	2	2	....
Totals	1,064,986	1,669	18.80	300	199	304	58	2	7	....	10	5	4	....	1	59	....	41	4	295	47	186	850	37	25	67	85	45	99	46	1	200	158	56	150

* Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF JANUARY, 1895.

Cities of less than 10,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1 000.	Total under one year.	Total under five years and over one year	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases	Cancer	Phthisis pulmonalis.	Total local diseases.	Apoplexy.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence	Premature and still births.
Alliance	7,607	10	15.64	....	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	2	....	2	6	...	....	....	1	....	....	....	....	1	..	1	1
Bellaire	9,934	14	16.89	2	3	2	1	..	..	..	1	..	..	..	..	..	..	..	..	4	....	4	5	....	....	....	....	....	1	..	....	3	2	1	1
Bucyrus	5,974	14	28.12	....	....	1	1	..	..	..	..	..	..	..	..	..	..	..	..	2	....	2	10	2	2	1	....	....	2	2	....	1	1	....	....
Circleville	6,556	9	16.47	1	....	1	..	..	..	..	..	..	..	..	..	1	..	..	..	2	....	2	5	1	....	....	1	1	1	....	....	1	....	1	....
Defiance	7,694	7	10.92	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	5	....	....	....	....	....	2	....	....	3	....	....	....
Delaware	8,224	7	10.21	1	2	3	..	..	1	..	1	..	..	..	..	1	..	..	..	1	....	1	3	1	....	1	....	....	....	....	....	....	....	....	1
Fremont	7,141	7	11.77	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	....	5	....	....	....	....	2	2	....	....	1	....	1	1
Fostoria	7,070	5	8.49	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	....	1	4	....	....	2	....	....	2	....	....	....	1	....	....
Galion	6,926	11	20.86	1	2	6	3	..	..	..	..	..	..	..	..	..	1	1	..	1	....	1	4	....	1	1	....	..	....	1	....	....	....	....	....
Gallipolis	4,498	2	5.31	....	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Greenville	5,473	6	13.15	....	....	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	3	2	1	....	....	....	....	1	....	....	....	....	....	1
*Kenton	5,557	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lancaster	7,555	14	22.25	1	3	1	..	..	..	..	..	..	..	..	..	..	..	1	..	3	1	....	9	1	..	3	....	1	....	1	....	....	1	....	1	....
Marietta	8,273	8	11.60	....	1	1	..	..	..	..	..	..	..	..	..	..	..	..	1	3	1	....	....	....	....	....	....	....	....	....	....	....	....	4	....	2
Marion	8,327	16	23.06	2	2	6	2	..	1	..	..	..	..	..	..	..	..	..	..	1	....	....	4	....	....	....	....	....	....	1	....	....	....	3	....	....
Martin's Ferry	6,250	12	24.04	2	1	2	1	..	..	..	1	..	..	..	..	..	..	..	..	3	....	....	6	....	....	..	..	1	1	2	....	1	1	..	1	4
Middletown	9,864	7	9.08	....	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	3	....	....	2	....	....	....	....	....	....	....	2	..	....	....	1	....
Mt. Vernon	6,027	8	15.90	1	.	2	....	..	..	..	..	..	..	..	..	..	..	1	1	2	2	....	2	....	....	1	....	....	1	....	....	....	....	1	....
Norwalk	7,195	7	11.68	..	..	1	....	..	..	..	..	..	..	..	..	..	..	1	....	2	1	....	3	....	1	....	....	....	2	.	..	..	1	....	....
Piqua	9,030	13	17.16	1	3	5	1	..	2	..	..	..	..	..	..	..	..	2	....	3	....	....	3	....	1	....	....	1	....	....	....	....	1	2	....	2
Pomeroy	4,726	3	7.64	..	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....
Salem	5,780	5	10.38	1	..	1	....	..	..	..	..	..	..	..	..	1	..	..	..	1	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	3
Troy	4,494	6	16.02	2	.	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	3	....	....	....	....	1	....	....	2	....	.	1
Urbana	6,510	12	23.65	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	1	8	3	....	....	1	....	3	....	....	1	....	....	1
Warren	5,973	3	6.03	..	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	2	..	....	1
Wash'gton C. H.	5,742	6	12.54	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	3	....	....	....	....	....	3	....	....	....	1	....	....
Wellston	4,377	9	24.67	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....	3	....	3	1	....	....	....	....	....	....	....	....	1	2	1	....
Wellsville	5,247	12	27.44	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	7	....	....	....	....	4	....	2	....	....	1	....	....	1
*Wooster	5,901	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Xenia	7,301	11	18.07	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	3	7	....	1	1	....	....	....	1	....	4	....	....	....
Totals	182,765	244	16.02	20	21	40	11	1	4	....	3	....	....	....	2	3	1	6	2	56	9	45	112	12	7	10	9	5	26	7	2	22	18	10	20

* Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF FEBRUARY, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexy.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Akron	27,601	36	15.63	....	...	4	...	....	....	....	....	....	....	....	....	....	....	1	....	4	....	4	19	.....	3	....	3	1	1	....	....	3	6	2	6
*Canton	26,189	.....	.....	...	...	...	...	....	....	....	....	....	....	....	....	....	....	....	....	...	.....	...	...	.....	...	...	...	....	....	....	....	...	...	...	...
Chillicothe	11,288	18	19.13	5	3	...	...	....	....	....	....	....	....	....	....	....	....	....	....	3	...	3	15	1	2	...	1	....	2	2	....	7	....	....	2
Cincinnati	296,908	555	22.43	65	64	57	16	....	6	....	4	6	....	....	....	....	....	12	2	106	51	71	335	16	5	43	8	10	34	20	...	99	39	18	48
Cleveland	261,353	413	18.96	110	38	48	6	†	3	†	.....	1	.....	1	.....	19	2	10	.....	69	17	35	215	10	4	17	38	16	24	15	1	63	54	22	34
Columbus	88,150	120	16.33	22	14	14	7	....	....	....	....	....	1	....	....	2	....	....	....	29	5	17	62	1	1	2	1	2	9	3	....	27	4	7	10
Dayton	61,220	109	21.37	22	9	8	4	.	1	....	....	....	....	....	....	....	....	1	1	19	2	18	67	1	2	1	....	2	5	1	....	19	2	2	12
East Liverpool	10,956	14	15.34	3	3	2	1	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	7	.....	.....	.....	3	....	2	....	....	2	....	....	....
Findlay	18,553	10	6.47	2	1	1	....	....	....	....	....	....	....	....	....	1	....	....	....	2	....	....	7	.....	.....	.....	1	....	2	....	....	....	....	....	....
Hamilton	17,565	29	19.81	9	4	3	2	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	18	.....	.....	.....	.....	..	6	1	.....	5	1	2	2
Ironton	10,939	17	18.65	1	1	2	....	....	....	....	1	....	....	....	....	....	....	1	....	4	1	3	9	....	....	....	....	1	....	....	....	2	1	1	2
*Lima	15,981	.....	.....	....	...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	...	...	...	...	...	...	...	...	....	....	....	....	...	...	...	...
Mansfield	13,473	11	9.79	....	1	1	....	....	....	....	....	1	....	....	....	....	....	....	....	2	....	1	6	....	1	....	....	2	1	....	....	1	2	....	1
Massillon	10,092	10	11.88	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	4	.....	.....	.....	.....	.....	1	....	....	2	1	....	....
Newark	14,270	17	14.29	2	....	2	....	....	....	....	....	....	....	....	....	....	....	2	....	3	1	1	11	1	2	.....	1	1	4	....	....	2	1	....	3
*Portsmouth	12,894	.....	.....	....	...	...	....	....	....	....	....	....	....	....	....	....	....	....	....	...	...	...	...	...	...	...	...	....	....	....	....	...	...	...	...
Sandusky	18,471	17	11.04	....	....	2	....	....	....	....	....	....	....	....	....	....	....	2	....	5	....	4	10	.....	.....	.....	.....	.....	1	....	....	5	....	....	....
Springfield	31,895	53	19.94	4	3	3	1	....	....	....	....	....	....	....	....	....	....	2	....	12	....	10	29	5	.....	3	..	1	7	1	....	9	8	1	2
Steubenville	13,394	13	11.65	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....	.....	....	....	....	....	....	....	....
Tiffin	10,801	15	16.65	....	..	3	2	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	2	.....	.....	.....	.....	.....	.....	.....	....	2	9	....	....
Toledo	81,434	109	27.11	24	6	20	...	....	1	..	1	1	....	....	....	....	....	2	....	22	2	12	39	....	4	5	3	....	7	2	2	7	21	7	21
Youngstown	34,220	36	13.00	10	8	8	2	....	....	....	1	....	....	....	....	2	....	1	2	2	....	2	21	2	.....	2	4	1	1	....	....	1	4	1	....
Zanesville	21,009	17	9.70	4	1	6	...	....	1	....	....	....	....	....	....	....	....	2	....	5	1	2	6	1	...	....	....	....	2	....	....	1	....	....	....
Totals	1,052,592	1,619	18.46	283	156	86	41	....	9	....	7	9	1	1	....	24	2	36	5	292	82	180	882	39	24	73	58	37	108	46	3	255	152	63	143

* Not reported. † Cholera morbus and cholera infantum, 2.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF FEBRUARY, 1895.

Cities of less than 10,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis	Cholera morbus.	Diarrhœal disease.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Alliance	7,607	5	7.82	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3	...	...	...	1	...	...	...	...	2	...	...	...
Bellaire	9,934	9	10.87	4	4	3	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	5	...	...	...	3	...	...	...	...	1	...	3
Bucyrus	5,974	5	10.04	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	1	1	...	...	...	1	1	...	1	...	...	1
Circleville	6,556	14	25.62	1	...	2	...	...	...	...	...	...	...	...	...	...	1	1	...	4	...	4	8	2	2	...	1	...	2	...	...	1	...	...	...
Defiance	7,634	14	21.84	...	...	10	...	...	...	...	1	...	2	4	...	...	...	1	2	...	...	...	2	...	...	...	...	...	...	...	...	2	2	...	2
Delaware	8,224	21	30.63	...	...	5	...	2	...	...	...	1	...	...	2	...	...	...	...	5	...	5	8	1	...	...	...	...	1	...	...	4	3	...	...
Fremont	7,141	7	11.77	2	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	3	...	2	2	1	...	...	...	...	...	1	...	...	1	...	...
Fostoria	7,179	7	11.88	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	5	1	...	...	...	...	4	...	...	...	...	...	...
Galion	6,826	5	9.48	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	3	...	...	...	...	...	1	...	...	...	...	...	...
Gallipolis	4,498	5	13.34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	1	...	...	...	...	1	...	...	...	...	2	...	...
Greenville	5,473	8	17.54	1	...	4	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	4	...	1	...	...	1	1	...	...	1	...	...	...
Kenton	5,557	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lancaster	7,555	9	14.29	2	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	3	1	2	7	2	...	...	...	...	2	1	...	...	...	...	...
Marietta	8,273	14	22.30	3	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	3	1	2	10	...	...	...	1	...	1	...	...	2	...	...	1
Marion	8,327	9	12.97	...	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...	4	...	4	3	...	...	...	...	...	1	...	...	2	...	...	...
Martin's Ferry	6,250	17	32.64	3	3	7	1	...	1	...	...	...	...	...	...	1	...	4	...	3	...	3	6	...	...	...	...	1	1	...	...	4	...	1	2
Middletown	9,861	9	11.53	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1	3	5	...	1	...	1	...	2	...	...	1	...	...	...
Mt. Vernon	6,027	13	25.88	3	2	3	...	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	6	1	...	...	...	1	1	...	...	2	3	1	...
Norwalk	7,195	8	13.41	1	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	3	1	2	3	...	1	1	...	1	1	...	...	...	...	...	...
Piqua	9,090	20	26.40	2	2	3	...	...	...	...	...	1	...	...	...	...	...	...	...	4	1	3	12	2	1	...	...	...	5	...	...	3	1	...	...
Pomeroy	4,726	4	10.16	1	...	3	...	1	...	...	...	...	...	...	1	...	...	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Salem	5,750	4	8.30	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3	1	...	...	...	...	...	...	...	1	...	...	...
Troy	4,491	4	10.68	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	2	...	...	...	2	...	...
Urbana	6,510	9	16.59	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	1	4	4	...	...	...	1	1	1	...	...	...	...	...	1
Warren	5,974	5	10.05	...	...	3	...	...	1	...	...	...	...	...	...	...	...	1	...	1	...	1	1	...	...	...	...	...	1	...	...	...	...	1	...
Washington, C. H	5,742	2	4.18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	1	...	...	...	...	...	1
Wellston	4,377	5	13.71	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	2	1	...	...	1	...	...	...	...	...	...	1	1
Wellsville	5,247	7	16.01	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	4	...	...	...	1	1	1	...	...	2	...	...	2
Wooster	5,901	12	21.40	...	2	3	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	1	7	...	...	...	1	1	1	...	...	2	...	...	...
Xenia	7,301	10	16.44	...	...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	...	5	...	...	...	...	1	...	...	...	2	1	...	...
Totals	188,666	261	16.61	27	16	61	5	5	4	1	1	3	2	4	3	3	1	14	3	53	5	44	126	12	7	1	10	9	25	5	....	33	15	6	12

* Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF MARCH, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population.	Total deaths, all causes.	Annual rate per 1 000.	Total under one year.	Total under five years and over one ear	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery	Malarial fevers.	Measles.	Puerperal fever	Scarlet fever.	Tonsilitis	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis Pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births
Akron	27,601	84	14.79	....	.....	12	3	...	....	....	...	.....	...	....	...	.....	....	2	....	6	3	2	13	.....	2	....	....	....	1	....	....	4	.....	3	...
*Canton	26,189	.....	.....	....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chillicothe	11,288	24	25.52	4	1	1	...	....	....	....	1	....	....	....	....	....	....	....	....	8	3	5	15	....	2	....	....	....	1	2	....	7	....	....	2
Cincinnati	296 908	582	23.52	70	64	62	8	..	4	....	5	2	..	4	2	...	.....	7	....	109	13	76	353	12	8	48	27	9	24	20	4	105	34	24	47
Cleveland	261,353	4'8	21.49	124	56	56	5	†	....	†	1	....	1	1	....	11	....	10	3	60	13	35	164	8	13	15	52	13	26	11	1	87	74	8	35
Columbus	88 150	125	18.15	19	14	13	3	....	....	1	...	....	..	....	....	....	....	1	....	30	3	21	62	1	...	5	1	4	7	5	....	20	8	7	10
Dayton	61,220	108	21.17	20	9	13	1	....	2	....	....	....	..	....	....	1	....	1	1	23	3	18	55	....	2	1	3	3	4	3	....	20	7	1	10
East Liverpool	10,956	19	20.81	3	1	2	....	....	....	....	....	....	....	....	....	....	....	2	....	2	.....	2	4	1	...	....	....	....	....	1	....	2	1	3	....
Findlay	18,553	18	11.64	2	3	4	1	1	1	....	....	....	....	....	....	....	....	....	....	3	1	2	11	..	2	....	....	....	5	....	....	2	....	....	....
Hamilton	17,565	36	24 59	9	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	1	6	22	.....	1	....	....	....	4	2	..	8	4	2	5
Ironton	10 9.9	9	9.87	1	1	6	1	....	....	....	....	1	....	....	....	2	....	2	....	1	....	....	2	....	....	....	....	....	1	....	....	1	....	....	2
*Lima	15,981	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Mansfield	13,473	13	11.58	2	1	3	....	....	....	....	....	....	....	1	....	....	....	....	....	7	1	....	7	1	....	....	....	....	1	....	....	4	2	....	....
Massillon	10,092	12	14.26	....	....	6	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	4	....	1	....	....	....	1	....	....	....	....	....	....
Newark	14,270	15	12 61	2	2	3	...	....	....	....	....	....	..	...	..	...	....	1	2	4	....	4	6	....	....	....	....	4	..	....	2	1	1	3
Portsmouth	12,394	28	47.11	3	4	6	....	....	....	....	....	1	....	....	....	....	....	2	1	2	....	1	7	....	1	2	1	....	7	....	....	6	2	....	....
Sandusky	18,471	12	7.78	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	12	1	....	1	1	1	....	....	....	....	3	....	1
Springfield	31,895	42	15 71	4	4	2	1	....	....	....	....	....	....	....	....	....	....	....	....	9	2	7	23	2	3	2	3	2	2	1	....	5	6	2	5
Steubenville	13,394	11	9.85	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tiffin	10,801	16	17 77	....	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	5	....	....	2	....	....	2	....	....	1	5	1	....
Toledo	81 434	119	17.54	27	12	26	1	....	5	....	2	....	....	....	....	1	....	1	....	21	....	17	47	....	....	4	8	2	7	1	....	11	15	10	13
Youngstown	33,220	50	18.07	10	....	20	2	....	....	....	....	....	....	....	....	11	....	1	2	3	....	1	20	3	....	6	2	2	3	2	....	2	2	5	3
Zanesville	21,009	24	13.23	2	....	2	....	....	....	....	1	....	....	....	....	....	....	....	....	8	4	3	12	....	1	1	...	1	....	2	....	1	....	1	....
Totals	1,064,986	1,765	20.08	305	189	239	28	1	12	2	8	6	1	6	2	26	....	30	9	302	47	207	964	31	36	87	98	41	97	50	5	291	162	68	136

*Not reported. †Cholera morbus and cholera infantum, 12.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF MARCH, 1895.

Cities of less than 10,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate, per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and d phtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexy.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Alliance	7,607	8	12.62	2	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	3	....	1	1	....	....	....	....	....	1	....	....	2	2	....	2
Bellaire	9,934	19	22.95	9	2	2	....	....	....	....	....	....	....	....	....	....	....	2	....	2	....	....	8	1	....	....	1	....	1	1	....	....	2	....	....	4
Bucyrus	5,974	6	12.05	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	2	....	....	2	1	....	....	....	....	....	....	....	....	....	....	....	1
Circleville	6,556	12	21.96	1	2	1	....	....	....	....	....	....	....	....	....	1	....	....	....	4	....	4	7	1	....	....	1	1	1	....	....	2	....	....	....	2
Defiance	7,694	12	18.78	....	....	8	....	....	....	....	....	....	5	....	....	....	1	2	....	3	1	2	4	....	1	....	....	....	1	....	....	2	....	....	....
Delaware	8,224	15	21.89	....	....	4	....	2	....	....	....	1	....	....	....	....	1	....	....	3	1	2	4	....	....	....	....	....	....	2	....	2	1	2	....
Fremont	7,141	12	20.16	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	7	1	....	....	1	....	....	2	....	....	2	2	1	....
Fostoria	7,070	8	13.58	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	5	1	....	....	....	....	....	3	....	....	1	....	....	2
Galion	6,326	9	17.07	1	1	1	....	....	....	....	....	....	....	....	....	1	....	....	....	3	1	....	3	....	....	....	1	....	1	....	....	....	1	1	1	....
Gallipolis	4,498	7	18.67	....	....	2	....	....	1	....	....	....	....	....	....	1	....	....	....	1	....	1	1	....	....	....	....	....	....	....	....	....	1	3	....	....
Greenville	5,473	8	17.54	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	3	1	....	....	....	....	....	1	....	....	1	2	....	....
*Kenton	5,557	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lancaster	7,555	5	7.94	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	3	....	....	....	....	....	....	1	....	....	1	1	....	....
Marietta	8,278	13	18.85	5	1	5	....	1	1	....	....	....	....	....	....	2	....	....	1	1	....	1	7	....	....	....	2	1	1	....	....	....	....	....	....
Marion	8,327	2	2.88	....	....	2	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	1	....	3	....	....	....	....	....	....
Martin's Ferry	6,250	14	26.88	4	1	3	....	....	....	....	....	....	....	....	....	....	1	1	....	1	....	1	6	....	1	....	....	1	2	....	....	2	1	3	3
Middletown	9,364	17	21.75	5	..	2	....	....	....	....	1	....	....	....	....	....	....	....	....	4	....	4	10	2	1	....	....	2	2	....	....	....	1	2	....	....
Mt Vernon	6,027	8	15.90	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	2	4	....	1	1	....	....	....	....	....	....	2	....	....	....
Norwalk	7,195	7	11.68	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	5	....	1	....	....	....	....	3	....	....	1	....	....	....
Piqua	9,090	8	10.56	1	1	1	....	....	....	....	....	....	....	....	....	....	....	1	....	2	....	2	3	....	....	....	1	....	1	....	....	....	1	2	....	....
Pomeroy	4,726	3	7.64	....	....	2	....	1	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Salem	5,780	5	10.38	....	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	1	....	1	....	....	....	....	....	....	1	....	....	....
Troy	4,494	9	24.03	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	6	2	....	....	1	....	....	....	....	....	3	....	....	....
Urbana	6,510	8	14.75	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	1	3	3	....	1	....	....	....	1	....	....	....	1	....	....	1
Warren	5,978	4	8.04	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	1	....	....	....	3	....	....	1
Washington C. H	5,742	5	10.45	....	1	..	..	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	2	....	....	....	....	....	2	....	....	....	....	1	....	....
Wellston	4,877	8	8.22	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	1	....	....	....	....	....	....	....	....	....	1	....	....	....
Wellsville	5,247	3	6.86	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	1	....	....	....
*Wooster	5,901	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Xenia	7,801	13	21.36	3	1	1	1	..	....	....	....	....	....	....	....	....	....	....	....	4	....	4	8	....	....	....	1	....	1	....	....	....	1	....	....	....
Totals	182,765	243	15.95	84	12	89	4	4	2	....	1	1	....	5	1	4	1	7	4	52	5	42	114	10	5	8	9	6	27	4	....	36	26	10	18

* Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF APRIL, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Akron	27,601	30	13.04	.....	....	7	2	.....	.....	.....	.....	.....	1	.....	....	1	.....	.....	.....	6	2	8	12	1	2	1	1	.....	2	.....	...	2	2	3	1
*Canton	26,189	.....	.....	..	....	...	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...	...	...	...	...	...	...	.....	.....	.....	.....	.....	.....	.....	.....
Chillicothe	11,288	15	15.93	4	....	2	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	...	1	9	2	1	...	...	1	3	.....	...	...	2	1
Cincinnati	296 908	523	21.14	78	39	52	6	.....	.....	.....	3	2	...	4	.....	.....	.....	6	2	114	10	72	297	16	6	30	18	15	32	22	.....	72	37	23	43
Cleveland	261,353	457	20.98	109	43	53	3	†	1	†	2	...	2	.....	.....	15	...	10	..	79	15	51	247	8	5	22	40	10	27	.....	.....	71	50	23	37
Columbus	88,150	98	13.35	21	3	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	33	7	2.	56	1	1	.....	.....	1	.....	3	.....	13	4	2	7
Dayton	61,220	78	15.29	12	7	5	.....	2	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	8	2	4	46	.....	.....	.....	.....	3	3	2	1	14	4	2	5
East Liverpool	10,956	12	13.14	3	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	3	3	...	2	...	.....	..	.....	.....	.....	.....	.....	1	.....	.....	.....
Findlay	18,553	24	15.52	3	3	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	.....	4	10	...	1	.....	.....	.....	.....	.....	.....	2	2	2	.....
Hamilton	17,565	28	18.56	5	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	5	.....	4	16	.....	.....	.....	.....	.....	7	.....	.....	3	.....	.....	1
Ironton	10,939	9	9.87	1	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	2	...	2	4	...	.....	.....	.....	.....	3	.....	.....	.....	.....	1	1
*Lima	15,981	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mansfield	13,473	11	9 79	2	1	3	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	1	2	3	...	.....	.....	.....	.....	1	.....	.....	1	1	..	.....
Massillon	10 092	12	14.26	...	...	7	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	..	1	3	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Newark	14,270	22	18.49	1	1	2	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	1	3	12	3	2	.....	.....	1	3	1	...	1	2	1	2
Portsmouth	12,394	16	15 49	.....	4	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	5	.....	5	8	.....	2	2	.....	.....	3	.....	.....	1	1	1	3
Sandusky	18,471	9	5 85	2	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	4	4	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	1
Springfield	31,895	26	13 55	2	2	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	6	1	5	17	2	1	.....	1	1	7	1	.....	2	8	2	5
Steubenville	13,394	11	9.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiffin	10,801	18	19.99	2	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	2	3	.....	.....	.....	.....	1	1	.....	.....	1	10	1	.....
Toledo	81,434	111	16 35	22	13	15	1	.....	2	.....	.....	.....	.....	.....	.....	1	.....	1	.....	17	2	14	56	1	.....	.....	.....	2	7	3	.....	9	9	3	13
Youngstown	33,220	45	16.26	7	8	12	2	.....	.....	.....	1	.....	.....	.....	1	4	.....	2	.....	8	2	5	21	2	1	.....	.....	3	3	.....	1	4	2	2	2
Zanesville	21,009	22	12.57	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	2	15	2	1	.....	.....	.....	3	1	1	4	2	...	2
Totals	1,064,986	1,567	17.82	273	129	178	20	....	7	....	6	3	4	4	1	25	....	24	3	326	46	246	841	89	24	72	79	38	116	34	4	201	131	68	124

* Not reported. † Cholera morbus and cholera infantum, 12.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF APRIL, 1895.

Cities of less than 10,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under 1 year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Alliance	7 607	3	4 73	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...
Bellaire	9,931	11	13.29	2	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	3	....	2	...	...	...	...	1	1	1	...	1	...	...	1
Bucyrus	5,974	8	16.07	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	4	...	...	...	1	...	2	...	...	1	...	...	...
Circleville	6 556	9	16.47	1	....	2	...	...	1	...	...	...	...	...	...	...	...	...	...	2	...	2	5	...	1	...	...	1	1	...	1	...	...	...
Defiance	7.694	9	14.04	....	....	1	1	...	...	...	...	...	...	...	...	...	...	...	...	6	...	4	2	...	...	...	...	2	...	...	...	...	...	1
Delaware	8,224	15	21 89	....	....	5	...	...	...	...	...	1	...	...	...	2	...	2	...	7	...	5	4	...	...	...	...	1	1	...	2	...	...	...
Fremont	7,141	12	20.16	3	....	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	1	1	8	...	...	...	2	...	2	...	...	1	...	...
Fostoria	7,070	9	15 28	2	....	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	6	...	...	...	1	...	4	...	...	...	...	1
Galion	6,326	8	15 17	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...	...	6	...	3	1	...	...	...	...	...	...	...	...	1	...	...
Gallipolis	4,498	4	10.67	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3	...	...	...	...	1	2	...	...	...	...	...
Greenville	5,473	5	10.96	1	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	....	...	....	4	...	...	...	...	...	1	2	...	1	1	...	...
*Kenton	5 557	.....	.....	..	..	....	...	...	...	...	...	...	...	...	...	...	...	...	...	....	...	....	....	...	...	...	...	...	...	...	...	...	...	...
Lancaster	7,555	14	22.25	1	..	1	...	...	...	...	...	...	...	...	...	...	...	...	1	4	1	3	9	2	...	...	...	...	1	...	...	1	...	...	...
Marietta	8 273	6	8.70	1	...	....	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	....	3	...	...	...	1	...	...	...	...	1	1	...	...
Marion	8,327	3	4 32	....	..	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	1	....	...	...	...	...	...	...	...	...	...	...	1	...	...
Martin's Ferry	6,250	18	34 56	6	....	3	1	...	...	...	...	...	...	...	...	...	...	1	...	6	...	3	3	....	1	...	...	...	...	1	...	1	1	2	...
Middletown	9,364	10	12.82	....	....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	5	1	4	4	...	1	...	...	...	1	1	...	1	...	...	...
Mt. Vernon	6 027	6	11.96	...	....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	....	1	...	...	...	...	...	...	...	...	...	...	...	...
Norwalk	7,195	8	13 34	..	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	4	2	...	2	...	...	...	...	...	...	...	...	...	...
Piqua	9,090	14	18.48	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	....	...	....	....	...	...	...	...	...	....	...	...	....	...	...	...
Pomeroy	4.726	4	10 16	..	1	1	..	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	1	...	...	...	...	...	...	...	...	1	...	...
Salem	5,780	11	21.18	...	....	4	...	...	...	...	...	1	...	...	...	...	...	...	...	2	1	1	5	..	1	...	...	...	1	...	...	1	...	...	...
Troy	4.494	9	24.03	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	2	3	2	1	...	...	...	...	1	1	1	...	...	...	...
Urbana	6,510	8	14.75	....	1	1	...	...	...	...	...	...	...	...	...	...	...	...	1	4	...	4	2	...	...	1	...	...	1	...	...	...	1	1	...
Warren	5,973	8	16.08	....	....	3	2	...	...	...	...	...	...	...	...	...	...	1	...	1	....	1	2	...	...	...	...	...	...	...	...	...	2	...	1
Wash'gt'n, C. H	5 742	3	6.27	....	..	..	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	1	...	...	...	...	1	...	...	...	...	...	...	...
Wellston	4,377	2	5 49	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...
Wellsville	5,247	8	18.29	....	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	5	1	4	...	...	...	...	...	...	...	...	...	...	1	...	...
*Wooster	5,901	.....	.....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Xenia	7,301	9	14.79	....	....	1	...	...	...	...	...	...	...	...	...	...	...	...	...	3	.....	3	6	.....	1	...	...	...	...	...	...	2	...	...	...
Totals	182 765	234	15.86	18	5	33	6	1	2	...	1	2	....	.....	.....	2	.....	5	2	81	11	59	88	10	7	2	5	2	21	7	...	15	12	8	5

* Not reported

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF MAY, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental disease.	Total violence.	Premature and still births.
Akron	27,601	40	17.39	....	....	16	6	....	....	....	....	....	9	....	....	....	....	1	....	7	....	7	11	....	1	....	2	....	1	1	....	....	4	2	1
*Canton	26,189	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chillicothe	11,288	25	26.58	7	1	5	....	....	....	....	....	....	....	....	1	....	....	1	3	6	2	2	8	1	....	....	....	....	2	1	....	2	3	3	4
Cincinnati	296,908	464	18.75	93	64	71	15	3	....	....	2	....	....	18	1	....	....	5	7	91	12	58	249	17	6	25	16	8	28	26	....	41	24	23	45
Cleveland	261,353	371	17.03	80	33	44	6	†	2	†	....	1	2	2	....	5	2	11	....	86	19	49	165	14	12	8	27	13	14	16	2	19	54	14	28
Columbus	88,150	100	13.61	14	6	8	3	2	....	....	....	....	....	....	....	....	....	....	....	28	2	19	50	3	5	....	4	2	6	8	....	5	5	8	8
Dayton	61,220	100	19.50	16	9	4	....	....	2	....	....	....	1	....	....	....	....	....	....	19	2	15	59	....	1	1	8	3	9	2	1	7	9	3	12
East Liverpool	10,956	15	16.43	1	1	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	6	2	....	....	....	....	2	....	....	1	....	....	....
Findlay	18,553	10	6.47	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	4	5	1	....	1	....	....	....	....	....	....	....	1	....
Hamilton	17,565	27	18.45	4	1	2	....	....	....	....	....	....	....	....	....	....	....	....	1	7	....	5	11	1	1	....	....	....	5	....	....	....	....	2	1
Ironton	10,939	19	20.94	1	1	3	....	2	....	....	....	....	....	....	1	....	....	....	....	3	1	2	7	....	1	....	....	2	2	....	....	2	2	....	....
Lima	15,981	23	17.27	3	2	7	2	....	....	....	1	....	1	....	1	....	....	....	....	6	1	3	4	....	....	....	....	....	2	....	....	2	6	....	1
Mansfield	13,478	13	11.58	1	....	2	1	....	....	....	....	....	....	....	1	....	....	....	....	2	1	1	6	....	....	....	....	....	3	....	....	1	2	1	3
Massillon	10,092	15	17.82	....	....	3	....	....	....	....	....	....	....	....	....	1	....	1	....	2	....	2	7	....	1	1	1	....	1	....	....	....	2	1	....
Newark	14,270	15	12.61	2	1	1	....	....	....	....	....	....	....	....	....	....	1	....	....	3	1	2	7	2	....	....	....	....	3	....	....	2	1	3	2
Portsmouth	12,394	16	15.49	....	....	2	....	....	....	....	....	1	....	....	....	....	....	1	....	6	....	6	3	1	....	....	....	....	1	1	....	....	2	2	1
Sandusky	18,471	18	11.70	....	2	1	....	....	....	....	....	....	1	....	....	....	....	....	....	5	....	4	8	....	1	....	....	1	2	....	....	1	....	4	....
Springfield	31,895	31	11.66	2	2	1	....	....	....	....	....	....	....	....	....	....	....	1	....	7	3	4	19	....	1	1	1	4	3	1	....	3	3	1	1
Steubenville	13,394	14	12.54	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tiffin	10,801	10	11.11	....	....	3	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	1	2	....	....	2	2	....	....
Toledo	81,434	118	17.26	18	7	15	1	1	....	....	2	....	....	....	....	....	....	1	....	18	3	9	54	2	4	2	7	5	7	1	....	9	21	10	12
Youngstown	33,220	54	19.50	8	3	15	....	....	....	2	....	....	....	....	....	....	....	8	1	2	1	1	25	3	1	....	5	4	2	3	....	6	1	2	7
Zanesville	21,009	20	11.42	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	2	14	3	1	....	1	1	....	2	....	....	3	....	2	3
Totals	1,080,567	1,518	16.85	252	133	204	36	7	6	2	5	2	15	20	4	7	3	25	12	305	48	195	723	50	36	38	72	45	95	62	3	106	141	82	129

* Not reported. † Cholera morbus and cholera infantum, 5.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF MAY, 1895.

Cities of less than 10,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Alliance	7,607	3	4 73																	1			1												
Bellaire	9,934	14	16 89	2	3	3	2								1					6		3	5						3			1			
Bucyrus	5,974	7	14.06			2														2		2	3		1				2						2
Circleville	6,556	11	20.14																	6		5	6	1		1			1			1			
Defiance	7,694	8	12.48			1														4	1	3	3		1		1		1						
Delaware	8,224	5	7.30			1					1									1			2									1			
Fremont	7,141	7	11 77	1																4	1	3	3		1			1		1					
Fostoria	7,070	4	6.79	2		1																	3						3						
Galion	6,326	8	5 69																	1			1									1			
Gallipolis	4,498	7	18.69																	4	1		4					1	1			2	1		
Greenville	5,473	4	8.77	1																4								1							
*Keuton	5,557																																		
Lancaster	7,555	5	7.94			1														2	1	1	2					1							
Marietta	8,273	6	8.70	1																2		2	2	1											
Marion	8,327	12	17 28			1	1													4	1		5					1	1	3			1		1
Martin's Ferry	6,250	12	23.04	4	2	3		1	1														7				2				1		1		
Middletown	9,364	11	14.09	2	1	3					2	1								3		3	5	2	2				1						
Mt. Vernon	6,027	6	11.96	1																			4		1				2	1					
Norwalk	7,195	9	15.01	1		1										1				2			6		2			2	1			1			
Piqua	9,090	12	15.84	1		1												1		3		3	3	1					1			1	1	1	2
Pomeroy	4,726	4	10.16			1		1												2		2	1						1						
Salem	5,780	6	12.46	2		2					1	1								2	1	1	2					1		1					
Troy	4,494	13	34.71	2	2	1		1												5		5	7	1				1		1					
Urbana	6 510	7	12 90	1		1												1		1		1	5		1			1	2						
Warren	5,973	3	6.03																	1	1		2												1
Wash'gton, C. H.	5,742	2	4.18	1																1		1	1												2
Wellston	4,377	6	16.44		2	1			1											1		1	1												1
Wellsville	5,247	4	9.14			2												1		2			2						2						1
*Wooster	5 901																																		
Xenia	7,301	6	9.86	2																3	1	2	2					1	1			1			
Totals	182,765	197	12 93	24	10	26	8	2	3		2	3	1		1	2		2	2	54	9	38	91	7	9	1	6	11	25	6		7	7	11	12

*Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF JUNE, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Akron	27,601	34	14.79	....	....	10	1	...	....	....	....	....	....	....	....	1	....	....	....	3	1	2	18	.....	4	.....	6	.....	4	.....	.....	3	2	1	1
*Canton	26,189	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chillicothe	11,288	19	20.19	3	..	1	...	...	...	...	...	...	...	...	...	...	...	...	1	8	1	4	58	1	1	1	...	...	1	2	...	...	2	...
Cincinnati	296,908	503	20.33	96	82	82	5	11	5	....	7	1	....	25	....	1	....	5	3	98	17	59	284	10	2	13	21	13	22	19	1	52	36	33	37
Cleveland	261,353	336	15.43	80	13	53	6	†	4	1	1	3	2	....	....	7	....	11	....	50	10	32	162	5	8	10	33	15	15	....	1	31	46	19	32
Columbus	88,150	94	12.79	16	6	15	2	8	...	...	...	...	...	...	...	2	...	1	...	31	7	22	40	1	2	1	2	4	3	9	...	4	1	5	7
Dayton	61,220	83	16.27	14	9	10	1	..	...	...	...	1	...	...	1	....	...	...	2	19	4	11	38	1	1	1	.....	2	5	3	....	6	7	7	5
East Liverpool	10,956	4	4.38	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	.....	.....	1	.....	.....	.....	.....	.....	...	...	...	1
Findlay	18,553	13	8.41	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	3	8	.....	.....	.....	.....	...	2	...	...	2	1	...	...
Hamilton	17,565	24	16.39	3	..	2	1	...	...	...	...	...	...	...	...	...	...	...	...	3	1	1	13	2	2	.....	.....	.....	1	1	.....	1	1	4	...
Ironton	10,939	16	17.48	1	1	7	1	....	3	...	...	...	...	...	...	...	1	...	1	2	...	2	2	.....	.....	.....	.....	.....	1	..	.....	1	1	2	...
Lima	15,981	16	12.01	3	....	3	...	...	...	...	...	...	...	...	...	...	...	...	1	8	2	6	2	1	1	.....	.....	.....	.....	.....	.....	.....	...	1	1
Mansfield	13,473	9	8.01	2	....	3	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	4	1	.....	.....	.....	.....	.....	.....	.....	.....	1	...	2
Massillon	10,092	5	5.94	....	....	..	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	1	2	.....	.....	.....	.....	.....	1	.....	.....	1	1	...	...
Newark	14,270	13	10.93	....	....	1	....	...	...	1	...	...	...	...	...	...	...	...	...	4	...	4	3	1	1	.....	.....	.....	1	.....	.....	.....	3	2	1
*Portsmouth	12,394	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
Sandusky	18,471	11	7.15	....	2	1	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	1	4	.....	1	.....	.....	.....	.....	.....	.....	.....	5	...	...
Springfield	31,895	35	13.14	1	1	2	...	...	1	...	...	...	...	...	...	...	...	...	...	9	3	6	21	6	4	1	.....	.....	3	1	...	1	1	2	1
Steubenville	13,394	10	8.96	....	....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tiffin	10,801	7	7.77	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	1	5	.....	.....	1	1	.....	1	1	.....	1	...	...	1
Toledo	81,434	106	15.62	20	5	14	1	1	4	...	1	...	1	...	1	1	...	1	...	15	5	8	52	3	1	1	4	5	0	1	.....	5	15	7	11
Youngstown	33,220	37	13.39	8	6	10	...	5	...	...	1	...	...	1	...	1	...	...	...	8	3	4	14	1	2	.....	1	1	1	1	.....	2	3	2	9
Zanesville	21,009	17	9.70	4	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	1	5	.....	2	.....	.....	2	1	..	...	...	1	2	...
Totals	1,068,573	1,392	15.54	255	127	218	22	26	17	1	10	5	3	26	2	15	....	20	7	270	55	168	656	33	32	29	68	43	72	38	2	110	124	90	111

* Not reported. † Cholera morbus and cholera infantum, 10.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF JUNE, 1895.

Cities of less than 10,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexy.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births
Alliance	7,607	6	9.46	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	4	1	....	....	....	....	....	....	....	....	....	....	....
Bellaire	9,934	7	8.49	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1
Bucyrus	5,974	10	20.08	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	1	6	....	....	....	....	....	1	2	....	....	1	....	2
Circleville	6,556	21	38.44	....	....	7	....	1	1	....	....	1	....	....	....	....	1	3	....	1	....	....	9	2	....	2	1	2	1	....	....	1	....	4	....
Defiance	7,694	8	12.48	....	....	5	....	....	....	....	....	....	....	3	....	....	....	....	....	2	....	2	1	....	....	....	....	....	1	....	....	....	....	....	....
Delaware	8,224	5	7.30	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	2	....	2	2	....	....	....	....	....	....	1	....	....	....	....	....
Fremont	7,141	5	8.33	1	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	1	1	....	....	....	....	....	1	....	....	....	....	1	....
Fostoria	7,070	2	3.40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	1
Galion	6,326	5	9.48	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	2	....	....	....	....	....	....
Gallipolis	4,498	5	13.34	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	2	1	1	2	....	....	....	....	....	1	....	....	1	....	....	....
Greenville	5,473	5	0.96	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	3	2	....	....	....	....	....	....	....	....	....	1	....
Kenton	5,567	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lancaster	7,555	7	7.94	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	2	....	....	....	....	1	1	....	....	1	....	....
Marietta	8,275	10	14.50	2	....	2	....	....	....	....	....	....	....	....	....	....	....	1	....	....	3	....	2	8	....	1	....	....	1	1	....	....	....	....	3
Marion	8,827	7	9.69	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	4	....	....	....	....	1	1	....	....	2	2	....	....
Martin's Ferry	6,250	10	9.20	1	....	4	....	1	1	....	....	....	....	....	....	....	....	2	....	2	....	....	4	1	....	....	....	....	2	....	....	....	....	....	....
Middletown	9,564	3	3.85	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	1	....	....	....	1	....	....	....	....	....	....
Mt. Vernon	6,027	6	11.96	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	3	1	....	....	....	....	....	....	....	....	1	....	....
Norwalk	7,195	10	16.68	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	4	2	....	....	....	1	1	....	....	....	1	3	....
Piqua	9,090	15	19.80	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pomeroy	4,726	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Salem	5,780	3	6.23	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	2	....	....	....	....	....	1	....	....	....	....	....	....
Troy	4,494	5	5.85	2	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	2	....	2	2	....	....	....	....	....	1	....	....	....	....	....	....
Urbana	6,510	2	3.69	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....
Warren	5,973	8	16.08	....	....	2	....	....	1	....	....	....	....	....	....	....	....	....	....	2	....	1	4	1	....	....	....	....	....	....	....	....	1	....	....
Washington C H	5,742	6	12.54	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	....	....	....	....	....	....	....	....	....	....	....	2	....	1
Wellston	4,377	4	10.98	....	....	3	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Wellsville	5,247	4	9.14	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	....	....	....	2	....	....	....	....	....	2
Wooster	5,901	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Xenia	7,301	9	14.78	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	1	7	....	....	....	....	1	3	....	....	....	....	....	....
Totals	178,039	188	12.95	12	1	34	....	5	4	....	....	1	1	....	4	1	1	8	1	33	5	21	87	14	2	2	2	10	16	7	....	8	9	8	10

* Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF JULY, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Akron	27 601	35	15.22	....	....	13	2	4	....	....	2	....	2	....	....	....	....	....	....	1	....	1	14	....	2	....	4	....	3	....	....	1	4	3	2
*Canton	26,189	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chillicothe	11,288	22	23 39	8	1	9	....	....	....	....	....	....	....	....	....	....	....	1	....	4	....	4	5	....	....	....	1	....	3	1	....	....	1	2	1
Cincinnati	296,908	553	22 3	136	107	136	10	34	6	4	21	3	....	10	....	....	....	7	5	94	12	68	261	10	7	24	16	12	13	34	....	30	31	31	60
Cleveland	261,353	533	21.54	261	51	172	4	†	2	†	7	4	....	1	....	....	....	5	....	83	19	32	167	3	7	7	38	9	21	15	1	22	69	33	35
Columbus	88,150	174	23.69	49	17	57	..	26	....	....	6	6	....	....	....	....	....	2	2	41	4	21	49	6	....	....	1	6	5	6	....	6	6	13	5
Dayton	61 22	109	21.37	33	9	27	....	12	....	....	1	....	....	....	....	4	....	5	1	22	8	14	38	2	....	1	4	1	4	3	....	2	9	6	5
East Liverpool	10,956	18	19.72	3	....	2	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	3	....	....	....	1	1	....	....	....	1	....	2	3
Findlay	18,553	16	10.35	2	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	5	1	3	7	1	1	....	....	....	....	....	....	1	2	1	....
Hamilton	17,565	30	20 49	6	2	7	1	1	....	....	....	1	....	....	....	....	....	1	....	4	1	3	15	2	....	....	....	....	2	1	....	....	1	2	....
Ironton	10,939	8	8.74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	1	2	1	....	....	....	....	....	1	....	....	....	....	....	....
Lima	15,981	24	18.02	6	3	10	....	4	1	1	1	1	....	....	....	....	....	....	2	4	....	3	5	....	3	....	....	1	....	....	....	1	4	1	....
Mansfield	13,473	7	6 24	3	1	3	..	3	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	1	....	....	....	....	....	2	1
Massillon	10,092	11	13.08	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	2	....	1	7	....	1	....	1	....	1	....	....	1	1	1	....
Newark	14,270	25	21.02	5	2	8	....	6	....	....	1	....	....	....	....	....	....	1	....	3	....	3	6	2	....	....	....	1	3	....	....	....	1	2	....
*Portsmouth	12,394	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sandusky	18,471	6	3.89	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	....	....	....	....	1	....	....	....	....	....	1
Springfield	31 895	35	13.14	4	2	3	....	....	1	....	....	1	1	....	....	....	....	....	....	2	....	2	17	3	4	2	....	2	3	2	....	....	10	3	5
Steubenville	13 394	11	9 85	1	1	2	....	....	....	....	1	....	....	....	....	1	....	....	....	1	....	1	7	....	1	1	....	2	3	....	....	....	....	1	....
Tiffin	10 801	15	16 65	....	....	4	3	1	....	....	....	....	....	....	....	....	....	....	....	3	1	2	3	....	....	....	2	....	....	....	....	1	4	1	....
Toledo	81,434	137	20 19	62	14	58	....	38	....	2	6	....	1	....	....	....	....	5	....	10	....	7	44	1	....	1	2	1	8	5	....	5	13	12	15
Youngstown	33,220	55	19 87	16	6	27	2	9	....	....	5	1	1	1	....	6	....	1	....	4	1	1	18	2	1	1	....	3	4	....	....	....	3	3	....
Zanesville	21,009	41	23.41	5	6	4	....	2	....	....	1	....	....	....	....	....	....	....	....	6	1	4	19	3	3	....	....	5	2	1	....	1	6	3	2
Totals	1,068,573	1 865	20.94	600	222	543	22	143	10	7	58	18	5	12	....	11	....	28	10	298	49	176	688	35	30	37	70	45	77	68	1	72	165	122	135

* Not reported. † Cholera infantum and cholera morbus, 141.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF SEPTEMBER, 1895.

Cities of less than 10,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Alliance	7,607	5	7.82	....	....	2	....	....	....	....	....	....	....	....	....	....	....	2	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....
Bellaire	9,934	5	6.04	4	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	1	....	....	....	....	2	....	....
Bucyrus	5,974	7	14.06	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	5	....	....	....	....	1	2	1	....	1	....	1	1
Circleville	6,556	12	21.96	....	....	2	....	....	1	....	....	....	....	....	....	....	....	1	....	2	....	2	5	1	....	....	1	1	1	1	....	....	2	1	....
Defiance	7 694	6	9 87	....	....	4	....	3	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	1	....	....	....	....	....	....	....
Delaware	8,224	8	11.67	....	....	3	1	1	....	....	....	....	....	....	....	....	1	....	....	1	....	1	2	....	....	....	....	....	1	....	....	1	1	1	....
Fremont	7,141	7	11.77	2	1	2	....	2	....	....	....	....	....	....	....	....	....	....	....	3	....	3	1	....	....	....	....	....	1	....	....	....	1	1	1
Fostoria	7,070	8	13.58	....	....	4	....	....	....	....	2	....	....	....	....	....	....	2	....	....	....	....	4	....	....	....	....	....	4	....	....	....	....	....	2
Galion	6 326	10	18 96	1	....	2	....	....	1	....	....	....	....	....	....	....	....	1	....	3	2	1	4	....	....	....	....	1	2	1	....	....	1	....	....
Gallipolis	4,498	3	8.01	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	....	....	....	....	....	....	1	....	....
Greenville	5,473	3	6.58	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
*Kenton	5,557	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lancaster	7,555	11	17 47	....	....	3	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	6	1	1	....	....	....	3	....	....	....	1	....	....
Marietta	8,273	5	7 25	4	1	2	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	2	....	....	....
Marion	8,327	12	17.28	....	....	6	3	2	....	....	....	....	....	....	....	....	....	1	....	2	....	2	2	....	....	....	....	....	2	....	....	....	2	....	....
Martin's Ferry	6,250	11	15.85	4	1	4	....	1	....	....	1	....	....	....	....	....	....	1	1	2	....	2	2	....	1	....	....	....	....	1	....	....	....	....	2
Middletown	9,364	8	12.41	4	....	5	....	....	....	....	2	2	....	....	....	....	....	1	....	1	....	1	2	....	....	....	....	....	1	1	....	....	....	....	....
Mt. Vernon	6,027	6	11.96	1	....	4	....	1	....	....	1	....	....	....	....	....	....	2	....	....	....	....	1	....	....	....	....	....	1	....	....	....	1	....	1
Norwalk	7 195	9	15.01	....	....	3	....	2	....	....	....	....	....	....	....	....	....	1	....	3	2	1	1	....	....	....	....	....	1	....	....	....	2	....	....
Piqua	9,090	16	21.12	4	1	8	....	....	....	1	....	....	....	....	....	....	....	2	....	....	....	....	6	1	1	....	....	....	1	2	1	....	2	1	....
*Pomeroy	4,726	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Salem	5,780	4	8.30	1	....	2	....	1	....	....	....	....	....	....	....	....	....	1	....	1	1	....	4	....	1	....	....	....	1	....	....	....	1	....	....
Troy	4,494	8	16.60	1	....	1	....	1	....	....	....	....	....	....	....	....	....	2	....	2	....	1	4	....	1	....	....	....	1	....	....	....	1	1	....
Urbana	6,510	6	11.83	....	1	5	....	1	....	....	....	1	....	....	....	....	....	3	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	1
Warren	5,973	7	14.06	2	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	2	....	....	3	....	....	....	....	....	2	....	....	....	....	1	....
Wash'gton C. H.	5,742	9	18.81	5	3	3	1	2	....	....	....	....	....	....	....	....	....	....	....	1	....	1	3	....	....	....	....	....	1	1	....	....	....	....	....
Wellston	4,377	8	21.96	1	2	3	....	....	1	....	....	....	2	....	....	....	....	....	....	4	....	4	1	....	....	....	....	....	....	....	....	....	....	....	2
Wellsville	5,247	6	13.72	....	....	4	....	3	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	1	....
*Wooster	5,931	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Xenia	7,301	9	14.78	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	4	4	....	....	....	....	2	1	....	....	....	1	....	....
Totals	178,039	209	14.09	37	10	70	5	23	4	1	5	4	3	....	....	....	1	21	1	37	5	28	65	3	4	.....	2	7	25	8	1	3	15	12	10

* Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF AUGUST, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases	Total violence.	Premature and still births.
Akron	27,601	43	18.69	....	....	19	2	8	....	1	2	....	....	....	....	....	2	1	6	1	4	16	...	1	....	2	1	3	2	.....	2	9	....	7
*Canton	26,189	.....	.....	...	...	...	....	....	....	....	....	....	....	....	....	....	1	....	4	.....	...	...	.....	....	....	....	....	....	3	....	.....	...	.....	....	...
Chillicothe	11,288	17	18.07	1	2	5	....	....	....	....	....	1	1	....	....	....	1	....	4	....	4	4	1	....	....	....	....	3	....	....	....	4	....	....
Cincinnati	296 908	442	17.87	112	57	111	7	17	6	....	10	2	....	3	....	....	7	9	82	14	48	233	16	8	15	8	13	24	28	....	29	25	25	46
Cleveland	261,353	475	21.81	85	61	148	8	102	2	2	8	2	1	....	....	1	9	....	59	19	39	116	3	7	2	37	18	19	17	....	13	57	38	82
Columbus	88,150	132	17 97	38	15	47	1	18	....	....	4	6	1	....	....	2	....	1	30	5	18	46	5	1	1	4	2	8	4	....	....	4	4	9
Dayton	61 220	85	12 58	17	5	20	....	8	....	2	....	....	....	....	....	....	4	2	20	3	12	34	....	4	....	1	2	5	3	.....	1	6	1	9
East Liverpool	10,956	11	12.05	7	...	3	...	3	....	....	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	....	....	....	....	....	2	....	....	....
Findlay	18,554	16	10.35	8	1	7	....	5	....	....	....	1	....	....	1	....	....	....	5	1	4	4	....	....	....	....	....	2	....	....	....	....	....	....
Hamilton	17,565	23	15.70	4	.....	7	....	2	1	....	....	1	1	....	....	....	1	....	4	1	2	7	1	1	....	1	1	2	....	....	....	4	....	....
Ironton	10,939	15	16.46	6	....	3	....	....	....	....	1	1	1	....	....	....	....	....	3	1	1	1	1	....	....	....	....	....	....	....	....	8	....	....
Lima	15,981	42	31 53	15	10	29	....	18	2	1	2	1	....	....	1	....	....	3	3	....	3	4	....	1	....	....	....	3	....	....	....	4	2	....
Mansfield	13,473	10	8.89	3	.....	4	....	2	....	....	....	1	....	....	....	....	....	....	3	1	1	2	....	....	....	....	....	1	....	....	....	....	1	3
Massillon	10,092	11	13.08	....	....	7	5	....	....	....	....	1	....	....	....	1	....	....	....	....	....	3	....	1	....	....	....	1	....	....	....	....	....	....
Newark	14,270	26	21.86	3	3	9	....	....	1	1	3	1	....	....	....	....	2	1	6	1	5	5	1	....	....	....	1	....	2	....	1	4	2	2
Portsmouth	12,394	16	15.49	2	2	3	....	1	....	1	....	....	....	....	....	....	1	....	4	1	3	4	1	3	....	....	....	....	....	....	..	1	3	2
Sandusky	18,471	18	11.70	6	1	9	1	5	1	1	....	1	....	....	....	....	....	....	3	1	2	5	....	....	....	....	....	1	....	....	....	1	....	....
Springfield	31,895	39	14.68	10	7	11	....	4	....	....	4	2	....	....	....	....	1	....	5	1	3	18	6	1	1	1	1	3	1	....	....	....	1	3
Steubenville	13,594	9	8.06	1	....	1	....	1	....	....	....	1	....	....	....	....	....	....	1	....	1	4	....	....	....	....	1	1	....	....	....	....	3	....
Tiffin	10,801	13	14.44	....	....	5	2	2	....	....	....	1	....	....	....	....	....	....	3	2	1	2	....	....	....	....	....	1	1	....	....	3	....	....
Toledo	81,434	137	20.19	43	23	32	1	25	....	....	....	1	....	....	....	1	2	....	17	....	11	51	2	....	2	7	....	5	4	....	2	19	18	16
Youngstown	33,220	47	16.98	11	12	22	....	4	....	....	7	1	....	1	....	7	....	....	3	....	1	15	3	....	....	1	3	1	2	....	1	5	2	2
Zanesville	21,049	34	19.40	9	4	8	....	8	....	....	....	....	....	....	....	....	....	....	3	1	2	17	4	2	....	....	....	....	1	2	....	....	3	2	2
Totals	1,080,967	1,661	18.44	481	203	510	27	233	12	9	39	25	7	4	6	12	....	38	17	265	53	66	593	44	30	21	64	43	84	66	....	51	149	110	133

* Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF AUGUST, 1895.

Cities of less than 10,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still-births.
Alliance	7,607	10	15 64	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	6	...	...	...	...	1	...	...	...	...	...	...	...
Bellaire	9,934	11	13.29	5	1	3	...	1	...	...	...	...	...	...	...	1	...	1	...	...	...	...	2	...	...	1	1	...	...	1	...	...	5	...	1
Bucyrus	5,974	6	12.05	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	3	1
Circleville	6,556	10	18.30	...	...	4	...	...	1	...	...	1	...	...	...	...	...	...	2	...	...	...	5	...	...	...	1	...	...	2	1	...	...	1	1
Defiance	7,694	9	14 01	...	...	3	...	1	...	...	...	...	...	...	...	...	...	2	...	4	...	4	2	...	...	1	...	...	1	...	...	...	1	...	...
Delaware	8,224	13	18.97	2	2	8	...	3	...	1	...	2	...	...	...	...	...	1	1	1	...	1	1	1	...	...	...	...	1	...	...	...	2	1	...
Fremont	7,141	6	10 08	...	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	2	3	1	...	1	...	...	...	1	...	...	...	...	...
Fostoria	7,070	4	6.80	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3	...	...	...	...	3	...	...	...	...	...	...	...
Galion	6,326	12	22 76	2	...	2	...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3	...	1	...	...	2	...	...	...	...	...	...	...
Gallipolis	4,498	2	5.31	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	6	...	...
Greenville	5,473	5	10 96	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	2	1	...	...	...	...	...	...	...	1	1	...	...
*Kenton	5,557	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Lancaster	7,554	7	11 13	3	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	4	2	...	...	...	...	...	...	...	...	1	...	...
Marietta	8,273	3	4 35	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	1	...	...	...	...	...	...
Marion	8,327	20	28.80	...	...	11	1	5	...	...	1	1	1	...	...	...	...	1	...	4	3	1	1	...	...	...	...	...	1	...	...	...	...	...	...
Martin's Ferry	6,250	6	11.52	2	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	1	...	...	...	...	...	...	...	...	...	...	...	...	2
Middletown	9,864	4	6.21	2	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	...	1	...	...
Mt. Vernon	6,027	8	15.90	3	...	5	...	3	...	...	...	1	...	...	...	...	...	...	...	1	...	1	2	...	...	1	...	...	...	...	...	1	...	...	...
Norwalk	7,195	7	11.68	3	...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	2	...	...	...	...	...	...	2	...	...	...
Piqua	9,090	5	6.60	1	4	3	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	2	...	1	...	1	...	...	...	...	...	...	...	2
*Pomeroy	4,726	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Salem	5,780	12	24.92	4	...	4	...	1	...	...	...	1	...	...	...	...	2	...	...	4	1	3	6	2	...	...	...	...	2	1	...	...	1	1	1
Troy	4,494	14	37 38	3	1	3	...	2	1	...	...	...	...	...	...	...	...	1	...	...	...	...	5	2	...	...	...	...	1	1	...	...	1	2	...
Urbana	6,510	6	11.83	1	2	4	...	2	...	...	1	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
Warren	5,973	9	18.09	...	...	7	1	4	...	...	...	...	2	...	...	...	...	...	...	...	...	...	2	...	...	...	...	1	...	1	...	...	...	...	...
Wash'ton C. H.	5,742	9	18.81	4	...	4	...	2	...	1	...	1	...	...	...	...	...	...	...	2	1	1	1	...	...	...	...	1	...	...	...	...	...	1	1
Wellston	4,377	5	13.71	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	2	...	...	...	...	1	1	...	...	...	1	1	2
Wellsville	5,247	12	27.44	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	3	5	...	...	...	...	...	...	...	...	...	...	...	...
*Wooster	5,901	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Xenia	7,301	9	14.78	2	...	3	...	2	...	...	...	...	...	...	...	...	...	...	...	2	...	1	2	...	...	...	...	...	1	...	...	...	...	2	...
Totals	178,039	224	15 04	38	14	76	2	31	2	2	3	8	4	...	...	1	...	11	3	35	5	23	72	10	4	4	3	8	13	8	1	6	18	17	11

*Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF SEPTEMBER, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Akron	27,601	36	15.65	....	....	11	2	2	....	....	....	1	....	....	....	....	....	....	4	....	13	2	7	9	2	....	....	....	....	....	4	....	....	5	2	4
*Canton	26,189	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chillicothe	11,288	23	24.36	5	1	6	....	....	....	....	....	....	....	....	....	....	....	....	5	....	8	....	4	7	....	2	....	2	1	1	....	....	....	....	....	2
Cincinnati	296,908	428	7.29	62	64	88	12	10	4	2	8	3	....	....	....	....	....	....	8	3	76	7	48	210	15	9	11	9	9	18	28	1	20	24	30	41
Cleveland	261,353	449	20.62	75	45	127	11	75	3	2	8	3	1	....	3	....	....	....	17	1	47	19	27	133	3	7	4	11	17	16	20	2	23	41	28	33
Columbus	88,150	193	18.18	31	16	42	8	11	....	1	2	2	3	....	....	....	....	....	8	....	31	4	20	39	2	3	1	....	4	7	4	....	3	9	7	7
Dayton	61,220	87	17.05	19	9	18	....	12	....	....	....	....	....	....	....	....	....	....	4	....	14	4	10	34	1	2	1	2	1	7	1	....	3	10	7	13
East Liverpool	10,956	7	7.67	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	4	2	....	....	....	....	2	....	....	....	....	....	....
Findlay	18,563	15	9.70	3	1	6	....	3	1	....	....	1	....	....	....	....	....	....	6	....	6	1	5	3	....	....	....	....	....	....	....	....	....	....	....	....
Hamilton	17,565	28	15.70	9	2	8	1	3	....	1	....	....	....	....	....	....	....	....	3	....	3	1	2	7	....	....	....	....	....	2	1	....	....	3	1
Ironton	10,939	19	20.84	4	3	10	5	2	....	....	....	2	....	....	....	....	....	....	1	....	2	....	2	2	....	1	....	....	....	....	....	....	1	5	....	....
Lima	15,981	30	22.53	14	1	14	....	8	2	1	....	....	2	....	....	....	....	....	1	....	2	2	....	9	2	1	....	1	1	3	1	....	....	1	3	1
Mansfield	13,473	12	10.68	5	1	7	....	5	....	....	....	....	....	....	....	....	....	....	2	....	1	1	....	3	....	....	....	....	....	1	....	....	1	....	1	1
Massillon	10,092	9	10.70	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	1	6	1	2	....	....	....	....	....	....	....	....	....	....
Newark	14,270	21	17.66	7	3	5	....	1	....	....	1	1	1	....	....	....	....	....	1	....	3	....	3	6	....	....	1	....	2	1	....	....	2	6	1	1
Portsmouth	12,394	17	16.46	2	1	6	3	....	....	....	....	....	....	....	1	....	....	....	1	....	3	....	2	4	1	....	1	....	....	1	1	....	....	....	4	....	....
Sandusky	18,471	11	7.15	5	....	2	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	6	....	....	....	1	....	3	....	....	....	....	....	3
Springfield	31,895	41	15.43	9	3	12	....	6	2	....	....	....	....	....	....	....	....	....	2	....	5	....	5	12	1	1	2	....	1	1	....	....	....	8	4	3
*Steubenville	13,394	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Tiffin	10,801	15	16.65	....	....	6	2	1	....	....	....	....	....	1	....	....	....	....	2	....	3	....	2	5	1	....	....	1	1	2	....	....	....	1	....	....
Toledo	81,434	152	22.39	37	25	41	1	17	....	....	3	2	....	....	....	1	1	....	6	3	18	4	11	47	....	1	....	1	1	7	2	....	4	20	13	13
Youngstown	33,220	39	14.09	9	8	1	1	....	....	....	4	1	1	....	....	....	8	....	2	....	5	2	1	11	2	2	....	1	1	2	2	....	1	4	1	5
Zanesville	21,069	23	13.13	8	1	9	....	4	....	1	....	....	....	....	....	....	....	....	2	....	....	....	....	11	1	2	....	....	....	3	3	....	....	....	2	2
Totals	1,067,573	1,590	17.87	444	183	421	46	159	12	8	22	16	8	3	5	9	....	69	7	244	47	152	568	34	33	21	29	39	77	67	3	58	138	102	130

* Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF SEPTEMBER, 1895.

Cities of less than 30,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional disease.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Alliance	7,607	5	7.82	....	....	2	....	....	....	....	....	....	....	....	....	....	....	2	....	1	....	1	1	....	....	....	1	....	....	....	....	....	....	1	....
Bellaire	9,934	5	6.04	4	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	....	....	....	....	2	....	....
Bucyrus	5,974	7	14.06	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	1	2	1	....	....	1	1
Circleville	6,556	12	21.96	....	....	2	....	....	1	....	....	....	....	....	....	....	....	1	....	2	....	2	5	1	....	....	....	1	1	1	1	....	2	1	....
Defiance	7,694	6	9.87	....	....	4	....	3	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	....	....	....	....	....	1	....	....	....	....	....	....
Delaware	8,224	8	11.67	....	....	3	1	1	....	....	....	....	....	....	....	....	1	....	....	1	....	1	2	....	....	....	....	1	1	....	....	....	1	1	....
Fremont	7,141	7	11.77	2	1	2	....	2	....	....	....	....	....	....	....	....	....	....	....	3	....	3	4	....	....	....	....	....	1	....	....	....	1	1	2
Fostoria	7,070	8	13.58	....	....	4	....	....	....	....	2	....	....	....	....	....	....	2	....	....	....	....	4	....	....	....	....	....	4	....	....	....	1	....	....
Galion	6,326	10	18.96	1	....	2	....	....	1	....	....	....	....	....	....	....	....	1	....	3	2	1	4	....	....	....	....	1	2	1	....	....	1	....	....
Gallipolis	4,498	3	8.01	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....
Greenville	5,473	3	6.58	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	1	....
*Kenton	5,557	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lancaster	7,555	11	17.47	....	....	3	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	6	1	1	....	....	....	3	....	....	....	1	....	....
Marietta	8,273	5	7.25	4	1	2	....	1	1	....	....	....	....	....	....	....	....	....	....	2	....	1	2	....	....	....	....	....	....	....	....	....	2	....	....
Marion	8,327	12	17.28	....	....	6	3	2	....	....	....	....	....	....	....	....	....	1	....	2	....	2	2	....	....	....	....	....	2	....	....	....	2	....	....
Martin's Ferry	6,250	11	15.85	4	1	4	....	1	....	....	....	1	....	....	....	....	....	1	1	2	....	2	2	....	1	....	....	....	....	....	1	....	....	....	2
Middletown	9,364	8	12.41	4	....	5	....	....	....	....	2	2	....	....	....	....	....	1	....	1	....	1	2	....	....	....	....	....	1	1	....	....	....	....	....
Mt. Vernon	6,027	6	11.96	1	....	4	....	1	....	....	....	1	....	....	....	....	....	2	....	1	....	1	1	....	....	....	....	....	....	....	....	....	1	....	....
Norwalk	7,195	9	15.01	....	....	3	....	2	....	....	....	....	....	....	....	....	....	1	....	3	2	1	1	....	....	....	....	....	1	....	....	....	1	2	1
Piqua	9,090	16	21.12	4	1	3	....	....	1	....	....	....	....	....	....	....	....	2	....	....	....	....	6	1	1	....	....	....	1	2	1	....	2	1	....
*Pomeroy	4,726	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Salem	5,780	4	8.30	1	....	2	....	1	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Troy	4,494	8	16.60	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	2	....	1	4	....	1	....	....	....	1	....	....	....	....	1	....
Urbana	6,510	6	11.83	....	1	5	....	1	....	....	....	....	1	....	....	....	....	3	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	1
Warren	5,973	7	14.06	2	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	2	....	....	2	....	....	....	....	....	2	....	....	....	....	1	....
Wash'gton C. H.	5,742	9	18.81	5	3	3	1	2	....	....	....	....	....	....	....	....	....	....	....	1	....	1	3	....	....	....	....	....	1	1	....	....	....	....	....
Wellston	4,377	8	21.96	1	2	3	....	....	1	....	....	2	....	....	....	....	....	....	....	4	....	4	1	....	....	....	....	....	....	....	....	....	....	....	2
Wellsville	5,247	6	13.72	....	....	4	....	3	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	1	....
*Wooster	5,901	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Xenia	7,301	9	14.78	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	4	4	....	....	....	....	....	....	1	....	....	....	1	....	....
Totals	178,039	209	14.09	37	10	70	5	23	4	1	5	4	3	....	....	....	1	21	1	37	5	28	65	3	4	....	2	7	25	8	1	3	15	12	10

*Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF OCTOBER, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Akron	27,601	28	12.18	....	....	7	3	....	1	....	....	....	....	....	....	....	....	3	....	4	1	2	10	3	2	....	....	1	....	....	....	....	6	1	1
*Canton	26,189	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chillicothe	11,288	10	10.63	1	1	4	1	....	....	....	....	....	....	....	....	....	....	2	....	2	....	2	1	....	....	....	1	....	....	....	....	2	....	....	....
Cincinnati	296,908	404	16.33	77	57	50	16	3	....	....	6	1	....	....	1	1	....	10	2	81	16	46	207	11	1	15	9	12	30	16	1	32	35	29	45
Cleveland	261,353	451	20.70	98	67	106	56	17	1	....	....	3	2	....	1	2	1	17	....	63	14	46	155	7	3	13	37	17	31	8	1	38	38	22	30
Columbus	88,150	135	18.38	17	17	50	18	2	....	....	3	....	2	....	....	3	....	19	1	29	4	16	41	1	2	1	3	1	8	1	....	7	7	6	7
Dayton	61,220	113	22.15	15	10	28	6	3	....	....	....	....	2	....	....	....	....	14	1	22	5	16	41	1	2	1	2	1	2	1	....	9	9	7	7
East Liverpool	10,956	4	4.38	....	1	1	....	....	....	....	....	....	....	....	....	1	....	....	....	1	1	....	2	....	....	....	1	....	....	....	....	1	....	....	1
Findlay	18,553	9	5.82	1	1	3	....	....	....	....	....	1	....	....	....	....	....	2	....	....	....	....	6	....	....	1	....	....	2	....	....	1	....	....	....
Hamilton	17,565	21	14.35	6	1	5	1	1	....	....	....	....	....	....	....	....	....	3	....	5	....	3	7	....	....	....	....	....	2	....	....	....	2	....	....
Ironton	10,939	32	34.92	2	12	20	10	....	....	....	....	8	....	....	....	....	....	2	....	8	3	5	1	....	....	1	....	....	....	....	....	....	1	2	....
Lima	15,981	17	12.77	2	....	5	....	....	....	....	....	1	1	....	....	2	....	1	....	2	....	2	7	1	....	....	....	1	4	....	....	1	2	1	3
Mansfield	13,473	17	15.14	3	....	8	....	1	....	....	....	....	1	....	....	....	....	4	....	3	....	3	4	....	....	1	....	....	....	....	1	....	1	1	2
Massillon	10,092	12	4.26	....	....	5	3	1	....	....	....	....	....	....	....	....	....	1	....	1	....	....	5	....	2	....	1	....	....	....	....	....	....	1	....
Newark	14,270	18	15.14	2	3	5	2	....	....	....	2	....	....	....	....	....	....	1	....	1	....	1	6	1	1	....	1	....	1	1	....	1	3	3	1
*Portsmouth	12,394	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Sandusky	18,471	9	5.85	2	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	2	2	....	6	....	....	....	....	3	2	....	....	....	....	....	1
Springfield	31,895	41	15.43	7	2	8	....	2	....	....	....	....	....	....	....	....	....	6	....	9	3	6	13	3	....	2	....	2	4	1	....	....	8	2	1
Steubenville	13,394	12	10.75	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	2	1	7	1	....	....	2	1	....	....	....	1	....	2	....
Tiffin	10,801	13	14.44	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	2	....	....	1	....	....	1	....	....	....	6	3	....
Toledo	81,434	139	20.48	16	25	38	13	5	....	....	1	1	....	....	....	....	....	11	....	20	5	10	56	2	1	4	4	4	11	3	....	4	14	11	20
Youngstown	33,220	48	17.34	3	16	24	6	2	....	....	2	....	....	....	....	12	....	1	....	4	1	1	16	1	1	....	2	2	2	2	..	5	2	2	4
Zanesville	21,009	22	12.57	3	1	5	....	....	....	....	1	1	....	....	....	....	....	1	....	4	1	2	8	....	....	....	....	....	2	1	....	1	2	3	....
Totals	1,068,573	1,555	17.46	267	216	373	135	48	2	....	13	18	8	.....	2	21	1	98	4	266	58	164	601	32	15	40	63	45	102	34	3	101	138	96	123

*Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF OCTOBER, 1895.

Cities of less than 10,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera Infantum.	Cerebro-spinal meningitis	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Alliance	7,607	5	7.89	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	2	2	....	....	....	....	1	....	....	....	....	....	....
Bellaire	9,934	13	15 70	2	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	7	....	....	....	1	....	1	3	....	....	....	3	3
Bucyrus	5,974	9	18.09	....	....	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	1	1	....	1	....	2	....	....	....	....	....	....
Circleville	6,556	16	29.28	....	1	6	....	....	1	....	....	1	....	....	1	....	....	....	....	3	....	2	7	2	....	1	1	....	3	....	....	....	....	....	....
Defiance	7,694	13	20.28	....	3	5	....	1	....	....	....	....	....	....	....	1	....	3	....	5	....	1	3	1	....	....	....	2	....	....	....	2	....	1	1
Delaware	8,224	10	14 60	....	....	2	....	....	....	....	1	....	....	....	....	....	1	....	....	2	....	2	5	....	....	....	3	....	....	....	....	....	1	....	....
Fremont	7,141	7	11.77	1	....	3	....	1	....	....	....	....	....	....	....	1	....	1	....	1	....	1	3	1	....	....	....	1	....	1	....	....	....	....	....
Fostoria	7,070	10	16.98	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	7	2	....	....	....	1	4	....	....	....	....	....	....
Galion	6,326	12	22.76	1	2	4	2	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	2	1	....	....	....	....	1	....	....	....	1	6	....
Gallipolis	4,498	3	8.01	....	....	2	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....
Greenville	5,473	3	6.58	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
*Kenton	5,557	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lancaster	7,555	10	15 88	1	1	1	....	....	....	....	....	....	....	....	....	1	....	....	....	4	....	4	5	1	1	....	....	....	....	....	....	....	....	....	....
Marietta	8,273	9	3.05	....	....	3	1	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	4	....	2	....	....	....	2	....	....	....	1	....	2
Marion	8,327	11	15.85	....	....	5	4	....	....	....	....	....	....	....	....	....	....	1	....	2	1	1	4	....	....	....	....	1	2	....	....	....	....	1	....
Martin's Ferry	6 250	9	17.28	2	1	5	....	....	....	....	....	....	....	....	....	....	....	4	1	1	....	1	2	....	....	....	1	....	1	....	....	....	....	....	....
Middletown	9,364	10	12.82	2	3	3	....	....	....	....	2	....	....	....	....	....	....	1	....	3	....	3	4	1	....	....	1	....	1	1	....	....	....	....	....
Mt. Vernon	6,027	9	17.94	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	6	2	1	....	....	....	2	....	....	....	1	2	....
Norwalk	7,195	5	8.34	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	2	1	....	....	....	....	....	....	1	....	....	....	2	....
Piqua	9,090	16	21.12	3	1	2	....	2	....	....	....	....	....	....	....	....	....	....	....	5	1	4	5	....	2	....	....	....	1	....	....	....	2	2	1	....
*Pomeroy	4 726	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Salem	5,780	6	12.46	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	2	2	2	....	....	....	1	....	1	....	....	....	....	....	....
*Troy	4,494	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Urbana	6 510	9	16.59	....	....	6	....	....	....	....	....	....	....	....	....	....	....	6	....	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....
Warren	5,973	12	24.12	1	....	3	1	....	....	....	....	1	....	....	....	....	....	1	....	3	....	....	4	2	....	....	....	1	1	....	....	....	1	1	....
Wash'gton C. H.	5,742	12	25.08	3	....	3	2	....	....	....	....	1	....	....	....	....	....	....	....	1	1	....	6	....	....	....	....	1	2	2	....	....	....	1	....
Wellston	4,377	6	16.44	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	1	....	1	1	....	....	....	....	2	....
Wellsville	5,247	6	13.72	....	....	2	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	2	....	....	....	....	....	....	....
*Wooster	5,901	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
*Xenia	7,301	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Totals	166,244	231	16.67	19	15	63	12	5	2	....	4	1	4	....	1	3	1	22	1	43	10	28	91	16	7	2	8	8	26	8	....	8	9	18	6

*Not reported.

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Akron	27,601	23	9.99	.....	.....	3	...	...	...	...	...	...	...	...	...	...	...	2	...	4	1	2	14	...	5	.....	.....	.....	2	...	...	2	...	2	...
*Canton	26,189	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.....	...	.....	...	.....	...	...	...	...	...	...	.....	...	...	...
Chillicothe	11,288	25	26.58	4	2	4	2	...	...	...	...	...	...	...	1	...	...	1	...	3	...	3	14	2	2	...	1	...	2	...	...	2	4	...	1
Cincinnati	296,908	432	17.46	65	49	64	24	4	2	...	6	1	...	2	...	2	...	8	2	93	16	56	232	10	6	30	7	14	25	11	2	43	35	8	36
Cleveland	261,353	422	19.34	82	64	77	43	...	...	...	1	1	...	...	3	2	1	6	1	63	17	38	159	7	8	15	27	19	23	7	...	53	51	38	27
Columbus	88,150	119	16.19	16	17	31	20	1	...	...	...	...	...	...	...	1	...	8	...	16	2	11	43	1	1	2	1	1	2	4	...	7	14	13	3
Dayton	61,220	76	14.89	11	9	12	8	...	2	...	...	...	...	...	1	...	1	4	...	9	2	4	38	1	...	1	3	6	5	...	...	5	7	4	3
East Liverpool	10,956	11	12.05	3	2	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	5	...	...	2	...	...	...	1	...	2	...	...	2
Findlay	18,553	14	9.01	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	2	3	7	...	1	...	...	...	2	...	...	2	...	2	...
Hamilton	17,565	44	30.06	5	8	11	5	...	1	...	...	...	...	...	...	...	...	4	...	9	4	4	18	1	1	...	...	...	5	...	...	2	2	1	...
Ironton	10,939	16	17.55	1	3	7	5	...	...	...	...	2	...	...	...	...	...	...	...	5	2	3	2	1	...	...	...	...	...	...	...	1	2	...	...
Lima	15,981	19	14.27	3	1	5	1	...	...	...	...	1	...	...	...	...	...	3	...	3	2	1	6	...	...	...	...	1	3	2	...	4	1	1	1
Mansfield	13,473	10	8.89	...	...	4	...	...	...	...	...	...	...	...	...	...	...	2	...	1	...	1	4	...	...	1	3	...	...	...	...	...	1	...	...
Massillon	10,092	5	5.94	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3	...	...	...	...	...	...	2	...	...	...	...	...
Newark	14,270	23	19.34	2	1	6	2	...	...	...	...	...	...	2	...	...	...	2	...	5	2	3	7	2	1	...	...	...	2	2	...	...	4	1	...
*Portsmouth	12,394	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Sandusky	18,471	16	10.39	5	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	4	1	2	9	...	...	1	2	1	3	1	...	...	1	1	2
Springfield	31,895	39	14.67	3	1	6	...	...	3	...	...	...	...	...	...	...	...	2	...	8	3	5	19	2	3	1	2	1	4	...	...	4	4	2	5
Steubenville	13,394	6	5.37	.....	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	2	...	...	...	...	1	...	...
Tiffin	10,801	10	11.11	...	.....	1	...	...	1	...	...	...	...	...	...	...	...	...	...	3	1	2	3	...	...	1	...	...	2	...	...	...	3	...	1
Toledo	81,434	117	17.24	22	17	25	12	...	...	...	2	...	...	...	...	1	...	4	...	10	1	5	51	...	2	7	4	1	9	3	...	13	19	12	12
Youngstown	33,220	48	17.34	11	11	17	5	1	...	...	2	...	...	2	...	7	...	...	...	5	2	3	20	...	2	2	2	3	4	1	...	2	4	2	4
Zanesville	21,009	17	9.70	1	1	2	...	...	...	...	...	...	...	...	...	1	...	...	...	7	2	4	5	...	...	2	...	1	...	...	...	...	1	2	2
Totals	1,068,573	1,492	15.91	235	228	278	123	6	9	...	11	5	2	4	5	14	2	47	3	254	60	151	663	27	32	65	52	50	97	33	2	138	155	91	99

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Cities of less than 10 000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year	Total zymotic diseases.	Croup and diphtheria.	Cholera Infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Alliance	7 6 7	3	4.73	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	....	....	....	....	....	....	....	....	....
Bellaire	9.934	18	21.74	2	3	5	1	....	....	....	....	....	....	....	....	1	....	3	....	2	1	1	5	....	1	....	2	....	2	....	....	....	6	....	....
Bucyrus	5 974	13	26 13	....	....	3	3	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	7	....	....	....	....	....	2	....	....	....	....	....	....
Circleville	6.556	17	31.12	....	....	5	....	....	....	....	....	....	....	....	1	....	....	1	....	4	2	2	7	....	1	....	1	2	2	....	....	....	1	1
Defiance	7.691	8	12.48	....	....	6	....	1	....	....	....	....	3	....	....	....	....	2	....	1	....	1	1	....	....	....	....	....	1	....	....	....	....	....	....
Delaware	8 224	11	16.05	1	....	3	1	....	....	....	....	....	....	....	....	....	....	1	....	3	....	3	4	....	....	....	2	....	1	....	....	1	1	....	1
Fremont	7,141	4	6 72	....	1	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	3	1	1	....	....	....	....	1	....	....	....	....	....
Fostoria	7,070	8	13.60	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	6	1	1	....	1	....	3	....	....	....	....	....	2
Galion	6,826	10	18.96	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	1	....	....	....	1	....	....	....	....	5	....	....
Gallipolis	4,498	7	18.67	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	2	1	1	3	....	....	....	....	1	1	....	....	2	....	1	....
Greenville	5.473	3	6 58	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	2	....	....	....	....	....	....	....	....	....	1
*Kenton	5.557	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lancaster	7,555	5	7.94	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	....	....	....	....	....	2	....	....
Marietta	8.273	5	7.25	....	....	2	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	2	1	....	....	....	....	1	....	....	....	1	....	....
Marion	8,327	11	15.85	....	....	3	2	....	....	....	....	....	....	....	....	....	....	1	....	2	....	2	2	....	1	....	....	....	1	....	....	....	4	....	....
Martin's Ferry	6,250	9	17 28	2	....	2	....	....	....	....	....	....	....	....	....	....	....	1	....	2	....	2	5	2	....	....	....	....	....	....	....	....	1	....	....
Middletown	9.364	6	7.70	1	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	1	4	1	1	....	....	....	2	....	....	....	....	....	....
Mt Vernon	6.027	9	17.94	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	6	1	....	....	....	....	1	2	....	2	1	1	....
Norwalk	7 195	4	6.67	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	3	....	1	....	....	....	1	....	....	1	....	....	....	....
*Piqua	9.090	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
*Pomeroy	4,726	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Salem	5,780	7	14.56	2	....	3	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	1	3	....	....	....	2	....	1	....	....	....	....	....	....
*Troy	4,494	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Urbana	6.510	7	12 90	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	3	2	....	....	....	....	....	....	....	1	3	....	1
Warren	5 973	4	8 04	1	....	2	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Wash'gton, C. H.	5,742	11	22.99	1	....	5	2	....	....	....	....	....	1	....	....	....	....	....	2	....	....	....	5	....	....	....	....	....	2	....	....	2	....	....	1
Wellston	4,377	8	21.96	.....	.....	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	1	1	....	....	....	....	1	....	....	....
Wellsville	5 247	10	22.87	....	3	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	8	....	....	1	1	....	2	....	....	....	1	2	....
*Wooster	5,901	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
*Xenia	7,301	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Totals	157.154	198	15.12	11	9	47	9	4	3	....	2	....	5	....	3	1	....	14	....	27	6	19	91	11	10	1	10	3	25	3	....	18	23	4	10

*Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF DECEMBER, 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cer. bro-spinal meningitis	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Akron	27 601	22	9.56	....	....	5	2	....	....	....	....	....	....	....	....	....	....	1	2	5	.....	3	9	2	1	....	1	....	....	....	....	1	3	2	2
*Canton	26, 89	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chillicothe	11,288	13	13 82	1	....	3	....	....	....	....	....	....	....	....	....	....	....	3	....	2	1	1	7	1	1	....	1	....	1	....	....	2	....	1	....
Cincinnati	296,908	543	21 94	80	82	111	49	1	1	....	6	2	....	7	....	2	....	23	3	91	9	68	284	21	9	31	16	18	28	16	3	66	34	23	51
Cleveland	261,353	359	16 48	73	48	72	14	2	7	....	....	1	....	....	....	1	....	4	2	59	16	32	171	11	8	9	21	19	28	8	....	34	44	13	29
Columbus	88,150	146	19.88	21	16	27	0	....	....	....	1	....	1	....	....	2	....	7	..	31	3	0	65	3	6	2	5	3	10	3	....	12	8	14	10
Dayton	61,220	84	16.46	9	10	18	7	....	....	....	....	....	....	....	....	....	....	2	..	15	1	12	44	1	1	2	3	1	6	2	....	5	6	3	10
East Liverpool	10,956	19	20.81	2	2	6	....	....	....	....	....	....	1	....	....	....	1	4	....	3	2	1	8	1	....	1	1	....	2	....	....	3	..	2	1
Findlay	18,563	14	9 05	1	1	3	....	....	1	....	....	....	....	....	....	....	....	2	....	4	....	3	6	....	....	....	....	....	2	....	....	1	....	1	....
Hamilton	17,565	27	18.45	7	2	3	2	....	....	....	....	....	....	....	....	....	....	....	....	7	3	3	10	1	1	..	1	....	1	1	....	4	2	....	....
Ironton	10,989	17	18.65	1	5	5	5	....	....	....	....	....	....	....	....	....	....	....	....	6	1	5	1	....	....	....	....	....	....	....	....	1	3	2	2
Lima	15,981	21	15.76	1	2	4	....	....	....	....	....	....	3	....	....	....	....	1	....	1	1	....	14	..	2	3	..	1	6	1	....	1	1	1	1
Mansfield	13 473	14	12.47	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	..	1	9	1	1	....	..	1	1	....	....	1	2	1	1
Massillon	10,092	7	8.32	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	..	1	3	..	..	....	2	....	....	1	..	....	2	....	....
Newark	14,270	23	19 33	1	1	1	....	....	....	....	....	....	....	....	....	1	....	....	....	5	2	2	9	1	....	1	....	....	3	1	....	3	4	4	1
*Portsmouth	12,394	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	..	..	..	..	..	..	....	....	....	....	....	....	..	..	..	....
Sandusky	18,471	10	6.19	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	2	5	.....	....	....	....	2	3	....	....	..	1	1	2
Springfield	31,895	35	13.17	4	5	2	....	....	....	....	....	....	....	....	....	....	....	1	....	5	.....	4	19	3	1	....	1	1	4	3	....	1	8	1	3
Steubenville	13,894	5	4,48	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	2	....	....	....	....	....	1	....	....	....	....	2	....
Tiffin	10,801	9	9.99	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	1	2	....	....	....	....	....	2	....	....	..	4	....	....
Toledo	81,434	129	19 01	25	19	25	8	2	....	....	....	....	....	....	....	....	5	2	24	7	10	55	....	1	5	7	2	10	3	....	11	19	6	15
Youngstown	33,220	39	14.09	5	10	14	3	....	....	....	....	....	....	....	....	8	....	1	....	3	....	2	15	....	....	1	2	2	....	....	....	3	4	3	5
Zanesville	21,009	27	15.42	....	2	5	....	....	....	....	....	....	....	....	....	3	....	1	....	4	3	1	17	..	1	1	..	....	3	1	....	3	1	....	3
Totals	1,068,573	1,563	17.55	233	200	301	100	5	10	....	7	3	5	17	....	19	....	56	9	273	52	172	754	46	33	56	61	50	111	40	3	152	146	80	136

* Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE MONTH OF DECEMBER, 1895.

Cities of less than 10,000 inhabitants.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Alliance	7,607	4	6.31	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1	1	...	...	...	1	...	...	1	...	...	...
Bellaire	9,934	13	15.70	4	2	2	...	...	...	...	...	...	...	...	...	...	...	1	...	2	...	2	5	...	...	...	1	1	...	...	3	3	1	1
Bucyrus	5,974	6	12.06	...	...	3	2	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	12	...	...	...	...	...	2	...	...	...	...	1	...
Circleville	6,556	14	25 61	2	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	4	2	2	8	...	...	...	1	2	2	3	...	...	...	1	...
*Defiance	7,694	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Delaware	8,224	11	16.05	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	1	4	3	1	...	1	...	1	...	...	...	1	1	...
Fremont	7,141	6	10.82	...	1	2	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	1	...	1	...
Fostoria	7,070	5	8.49	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	3	...	1	...	...	...	2	...	...	...	...	...	4
Galion	6,328	8	15.17	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	1	...	...	...	...	...	1	5	...	...
Gallipolis	4,498	4	10.67	...	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	2	...	...	...	...	...	1	...	1	...	...	1	...
Greenville	5,473	4	8.77	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	3	...
*Kenton	5,557	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lancaster	7,555	5	7.94	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3	...	...	...	...	1	...	...	...	...	1	...	...
Marietta	8,273	8	11 60	2	...	2	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	4	...	...	...	...	...	1	2	...	1	1	...	2
Marion	8,327	12	17.29	...	...	3	1	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	6	1	...	...	...	1	4	...	...	1	...	2	1
Martin's Ferry	6,250	10	19.20	...	...	5	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...	1	4	1	...	...	...	2	...	...	...	1	...	...	3
Middletown	9,364	5	6 41	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	4	1	1	...	...	1	...	...	...	1	...	...	...
Mt. Vernon	6,027	3	5.97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	2	...	...	1	...	...	2
Norwalk	7,195	5	8.48	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	2	...	1	...	...	...	1	...	...	...	...	...	...
Piqua	9,090	7	9.24	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	1	2	...	...	1	1	...	...	...	...	...	2	...	...
*Pomeroy	4,726	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Salem	5,780	3	6.23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	2	...	1	...	...	...	...	...	...	...	...	...	1
*Troy	4,494	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
*Urbana	6,510	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Warren	5,973	3	6 03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...	1	...	...
Washing'n C. H	5 742	8	16 72	...	1	2	2	...	...	...	...	...	...	...	...	...	...	...	...	3	...	3	2	...	1	...	...	...	...	...	...	...	1	...	...
Wellston	4,377	6	16.46	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3	...	1	...	...	1	...	...	...	1	...	2	...
Wellsville	5,247	7	16.01	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	4	1	3	2	...	...	...	...	...	1	...	...	...	...	...	...
*Wooster	5,901	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
*Xenia	7,301	.....	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Totals	152,040	157	12.39	13	12	24	8	...	1	...	2	...	...	...	...	2	...	6	...	30	6	23	72	7	7	3	3	10	17	5	1	11	14	14	14

*Not reported.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE YEAR 1895.

Cities of 10,000 inhabitants (census 1890) or over.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Akron	397	14.39	.....	.....	111	27	14	....	2	4	1	12	....	....	2	...	17	3	65	12	40	167	9	23	1	24	3	21	9	...	21	44	22	28
*Canton	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chillicothe	227	20.11	45	13	41	4	.. ..	....	....	....	....	2	1	....	2	....	14	5	55	8	36	102	9	11	2	7	4	23	8	....	20	10	15	17
Cincinnati	5,948	20.03	1061	785	988	161	84	31	6	85	24	....	85	5	6	....	120	34	1137	187	737	320*	165	72	321	166	149	308	260	12	648	398	278	554
Cleveland	5,167	19.77	1479	722	1049	135	376	27	6	23	19	13	5	11	118	6	117	8	784	192	456	2166	86	92	138	398	178	269	129	10	512	622	271	393
Columbus	1,504	17.06	284	160	323	82	68	....	2	16	14	8	....	....	18	....	57	4	358	50	230	614	31	23	21	30	33	79	56	1	120	75	94	91
Dayton	1,148	18.75	217	107	184	29	3?	9	2	1	1	3	....	2	3	1	87	8	217	41	149	541	8	15	14	34	28	58	21	2	103	83	47	104
East Liverpool	159	14.51	28	13	30	2	3	2	....	1	3	2	....	....	2	....	12	....	16	7	9	53	6	1	4	9	1	10	2	....	19	3	9	7
Findlay	179	9.11	33	17	35	2	9	3	1	....	3	1	....	1	1	....	4	....	46	6	31	82	2	5	2	1	....	19	..	....	16	9	9	.....
Hamilton	347	19.75	75	30	53	15	10	3	1	....	2	1	....	....	1	....	13	1	64	15	38	162	8	9	.....	3	1	41	9	....	25	15	20	11
Ironton	200	18 28	26	33	71	27	2	5	....	3	15	1	....	....	8	....	7	....	44	10	31	43	3	3	3	1	3	8	....	....	11	25	9	9
†Lima	192	18.02	47	19	77	3	28	5	3	4	4	7	....	2	2	....	6	6	29	8	18	51	4	8	3	1	5	21	4	....	5	22	10	8
Mansfield	136	10.09	24	5	41	3	12	....	....	....	1	2	1	1	....	....	9	....	22	5	11	51	3	2	2	4	4	9	.....	1	9	12	9	15
Massillon	117	11.59	.....	.....	36	10	1	....	....	1	1	....	....	....	2	....	2	....	14	1	10	50	4	9	.. ..	7	1	6	4	....	2	6	3	.....
Newark	238	16.67	31	20	47	5	7	2	2	3	6	4	....	....	1	1	8	6	44	9	32	87	15	7	2	3	12	23	6	....	19	32	22	19
†Portsmouth	110	17 75	13	12	20	3	2	.. .	1	1	3	....	....	1	....	....	5	1	21	1	18	59	4	8	8	1	.....	15	3	....	10	10	7	7
Sandusky	150	8.12	23	8	19	3	7	1	1	....	1	1	....	....	1	.....	3	....	35	5	23	79	2	2	2	6	8	19	1	....	13	8	7	12
Springfield	471	14.77	65	33	56	2	12	7	....	4	4	2	....	....	....	....	19	....	85	17	64	230	36	21	18	10	17	46	12	....	29	72	1	38
†Steubenville	117	9.52	5	2	4	....	1	....	....	1	....	....	....	....	1	....	....	....	6	3	3	24	1	1	1	2	4	7	.....	....	1	....	9	.....
Tiffin	150	13.89	.....	.....	33	19	5	2	....	....	1	....	1	....	....	....	5	....	26	6	16	89	2	....	4	4	4	14	2	....	9	59	6	1
Toledo	1,480	18.17	311	169	316	41	89	14	2	18	5	2	....	2	7	....	33	5	214	32	128	598	13	15	42	60	26	91	30	2	90	209	116	173
Youngstown	543	16.35	109	107	175	24	21	....	2	24	3	3	5	1	66	....	12	5	54	14	27	225	19	10	14	26	27	27	13	1	37	38	25	44
Zanesville	302	14.38	38	20	46	1	14	1	1	2	2	....	....	....	4	....	6	....	57	15	29	152	17	13	6	2	12	22	15	1	16	19	19	16
Totals	19,282	15.50	3915	2275	3755	598	800	112	32	191	115	63	97	28	243	8	506	90	3393	644	2186	8783	447	350	608	799	521	1136	584	30	1735	1771	1008	1547

* No reports received.

† Reports from Lima for eight months; Portsmouth, six months; Steubenville, eleven months.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING CITIES OF OHIO, DURING THE YEAR 1895.

Cities of less than 10,000 inhabitants.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Alliance	77	10.12	5	3	10	1	4	.....	.....	.....	.....	.....	.....	1	.....	.....	3	.....	17	3	9	35	5	4	.....	2	1	3	.....	.....	2	5	7	3
Bellaire	131	13.19	40	22	25	5	2	.....	.....	.....	.....	.....	.....	.....	3	.....	10	.....	17	1	15	57	1	1	1	8	3	9	8	.....	19	34	6	19
Bucyrus	97	16.24	3	...	13	7	1	.....	.....	.....	.....	.....	.....	2	.....	.....	1	1	21	2	16	53	5	5	1	4	3	15	8	.....	13	2	8	8
Circleville	158	23.74	6	5	38	1	4	10	.....	.....	.....	3	.....	2	2	2	4	6	33	5	26	76	11	3	6	12	9	16	11	1	7	2	9	7
†Defiance	101	14.29	...	3	45	1	8	.....	1	.....	.....	.....	5	9	3	1	.....	.....	25	1	18	29	1	3	1	2	4	11	.....	.....	7	.....	2	2
Delaware	136	16.54	5	4	39	2	9	1	1	2	8	.....	.....	.....	.....	6	2	6	31	3	28	44	3	...	2	5	2	4	5	.....	11	14	7	2
Fremont	82	11.48	10	5	11	1	3	.....	.....	.....	.....	1	.....	1	3	.....	.....	.....	18	2	15	33	5	2	1	1	5	5	6	.....	4	4	4	2
Fostoria	75	10.61	7	2	10	2	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	3	1	11	...	11	52	7	2	2	2	1	37	.....	.....	1	.....	.....	13
Gallia	98	15.49	8	5	21	7	5	1	.....	1	.....	1	.....	.....	.....	2	3	.....	18	3	9	33	2	2	2	1	4	10	2	.....	4	18	8	.....
Gallipolis	54	12.01	...	...	10	2	2	1	.....	.....	.....	.....	1	.....	2	1	.....	.....	11	3	8	19	1	.....	.....	.....	3	6	.....	1	5	11	3	.....
Greenville	59	10 78	7	4	7	...	.....	.....	.....	1	.....	.....	.....	.....	2	.....	.....	.....	11	4	5	29	6	3	.....	.....	2	4	2	.....	3	5	6	2
Lancaster	111	14.69	13	9	12	...	3	.....	.....	.....	.....	.....	.....	1	1	.....	3	1	22	3	19	66	11	3	3	.....	5	9	5	1	5	7	2	1
Marietta	95	11.48	23	4	24	2	6	2	.....	1	1	1	.....	.....	2	.....	5	2	15	3	11	41	4	3	...	4	1	7	3	.....	5	10	3	9
Marion	126	15 13	2	2	44	18	10	3	.....	1	1	1	.....	.....	.....	.....	5	.....	23	6	11	37	1	1	.....	1	5	16	1	2	7	11	5	4
Martin's Ferry	138	20 48	31	12	42	3	7	3	.....	2	1	.....	.....	.....	1	.....	15	3	25	1	17	49	4	3	1	6	6	8	3	1	12	3	9	17
Middletown	98	10.47	18	7	19	1	1	.....	.....	9	3	.....	.....	.....	.....	.....	2	.....	27	3	24	49	9	10	...	2	3	10	7	.....	6	.....	4	.....
Mt. Vernon	89	14.77	10	4	17	...	4	2	.....	.....	3	.....	.....	.....	.....	.....	4	1	15	5	8	41	6	4	4	.....	1	11	3	.....	8	9	5	3
Norwalk	94	13 07	7	3	15	1	7	.....	.....	.....	.....	.....	.....	.....	1	.....	3	.....	27	5	19	36	3	11	.....	2	4	10	1	.....	5	2	7	...
†Piqua	141	16.95	14	16	19	1	3	2	1	.....	1	.....	.....	.....	.....	.....	8	.....	22	3	19	38	5	6	1	5	.....	9	2	1	8	13	4	6
†Pomeroy	18	9.14	1	1	8	...	4	1	.....	.....	.....	.....	.....	1	.....	.....	2	.....	6	1	5	3	.....	1	.....	.....	.....	1	.....	.....	.....	.....	1	2
Salem	78	13.49	14	1	21	1	3	.....	.....	1	4	1	.....	1	1	.....	4	.....	13	6	7	26	5	2	2	3	3	7	2	.....	3	4	2	5
†Troy	72	21.36	13	3	7	...	5	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	20	3	16	34	9	1	.....	1	2	5	2	.....	7	6	4	3
†Urbana	84	14 06	10	8	20	...	4	.....	.....	.....	.....	2	.....	.....	.....	.....	10	3	24	3	19	34	5	2	1	2	4	12	3	.....	3	3	2	7
Warren	73	12.22	6	...	23	4	6	2	.....	.....	.....	3	.....	.....	.....	.....	6	.....	10	4	3	25	5	...	.....	.....	2	5	.....	.....	4	9	4	7
Washington, C. H.	79	13.76	14	6	18	7	4	.....	1	...	1	2	.....	.....	.....	.....	2	.....	20	2	18	27	.....	1	.....	.....	1	11	3	.....	2	6	3	6
Wellston	69	15 76	3	7	13	...	5	3	.....	.....	.....	2	.....	.....	1	.....	1	.....	17	...	16	9	2	1	1	2	4	2	.....	.....	6	3	7	6
Wellsville	91	17 37	....	4	29	5	3	2	.....	2	.....	.....	.....	1	.....	.....	1	.....	19	2	15	39	..	.....	1	5	2	16	.....	.....	3	1	3	10
†Wooster	12	24.40	....	2	3	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	2	.....	1	7	.....	.....	.....	1	1	1	.....	.....	2	.....	.....	.....
†Xenia	87	15.88	13	2	8	1	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	...	29	3	22	44	.....	2	1	1	3	7	1	.....	9	4	2	1
Totals	2,623	14.79	286	144	571	73	116	34	4	25	26	20	9	18	23	8	119	19	549	80	410	1075	116	76	31	72	84	267	78	7	171	186	127	145

† Reports from Defiance for 11 months; Piqua, 11 months; Pomeroy, 5 months; Troy, 9 months; Urbana, 11 months; Wooster, 1 month; Xenia, 9 months.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF JANUARY, 1895.

Sixty-three villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Ada	2,079	4	24.08																			2	2									2			
Ashtabula	8,338	11	15.83	4	1	2	1							1						2		2	3		1				1			1		1	
Athens	2,640	3	3.64																	1		1	1												
Avondale	4,473	4	10.73																													2			
Beach City	800	2	30.00	1																							1					1			
Bellefontaine	4,245	6	14.18																	1		1	2		1				1						
Bellevue	3,052	4	15.73		1																														
Blanchester	1,196	2	20.07			1														1		1	1										1		
Bloomingburg	638	5	91.05																																
Bryan	3,068	5	19.55			1														3		1	4									1	1		
Carthage	2,257	4	21.27																	1															
Centerburg	688	1	20.41																			1	1												
Clifton Hamlet	1,575	1	7.61																																
Clyde	2,327	3	15.47																	1		2	3									1			
Conneaut	8,241	5	18.51																1																
Coshocton	8,672	8	26.14			2														2		1	5					1				2	1		
Crid ersville	465	2	51 61																	1			1			1							1		
Cuyahoga Falls	2,614	4	18.36	1																			2						2				2		
East Palestine	1,816	2	13.21																																
Fairport Harbor	1,171	4	40.99																														1		
Frankfort	667	1	17.99	1																															
Franklin	2,729	2	8.79		1	1	1													1		1	2												
Gloucester	2,500	2	9.60																																
Greenwich	881	1	13.62		1	1		1														1	1										1		
Hicksville	2,141	2	11 21																																
Jackson	4,329	6	16.66			2	2				1									1		1	1						1				1		
Jenera	800	2	30.00																																
Kent	3,510	2	6 84	1																1		1	2		1								1		
Lebanon	3,051	4	15.73																																
Linwood	1,291																						1				1								
Lewisville	2,436	1	4.25																														1		
Lockland	2,474	7	34.86																			2	2				1						1		
Logan	3,119	1	8.85		1																														

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ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF FEBRUARY, 1895.

Eighty-four villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Ada	2,079	2	11.54	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	....	....	....	1	....	....	....
Archbold	780	1	15 38	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Ashtabula	8,338	14	20.15	2	3	2	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	1	10	1	1	....	1	....	....	....	1	6	1	....	2
Athens	2,640	3	13.64	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	1	....	....	3	....	....	....
Avondale	4,473	10	26 83	1	....	4	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	5	....	1	1	....	....	....	....	....	3	....	....	3
Beach City	300	1	40.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Bedford	1,043	1	11.50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....
Bellefontaine	4,245	2	5.65	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Bellevue	3,052	3	11.79	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Belmont	384	1	31.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Berea	2,533	11	52.11	2	1	3	1	1	....	....	....	....	1	....	....	....	....	....	....	3	1	....	2	....	....	....	....	....	....	....	....	2	....	....	....
Blanchester	1,196	4	40.14	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	2	2	....	....	....	....	....	....	2	....	....	....	....	....
Bowling Green	3,467	6	20 77	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	3	....	....	....	....	....	1	....	....	2	....	....	2
Bridgeport	3,369	1	3 56	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Brooklyn	4,585	1	2.62	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	1	....	....
Bryan	3,068	3	11.73	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	1	....	....	....	....	....	....	1	1
Carthage	2,257	8	42 54	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	7	1	....	2	....	....	1	....	....	3	....	....	....
Centerburg	588	1	20 41	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Clarksfield	500	1	24.00	....	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clifton, Ham. Co	1,575	2	15.22	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	....	....	....	....	....	....	....	....	....	1	....	1
Clyde	2,827	4	20.63	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	....	1	....	....	1	....	....
Conneaut	3,241	5	18.51	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	3	....	....	....	....	....	....	2	....	....	1	....	....	....
Coshocton	3,672	8	26.14	....	....	2	1	....	....	....	....	....	....	....	1	....	....	....	....	2	....	2	1	....	....	....	....	....	....	1	....	....	2	1	....	....
Cridersville	465	2	51.61	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....
Cuyahoga Falls	2,614	5	22.95	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	....	....	....	....	1	....	....	1	2	....	....	....
East Palestine	1,816	1	6 60	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....

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ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, ETC.—Concluded.

Eighty-four villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera Infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Uhrichsville	3,842	1	3.13	....	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Union City	1,293	5	46.40	....	....	3	1	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	2	....	....	....	....	2	1	....	....	1	....	....	....	....
Wadsworth	1,574	4	30.48	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	4	....	2	....	....	2	....	....	....	....	....	....	....
Wapakoneta	3,616	4	13.28	2	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	2	....	1	1	....	....	....	....	....	....	....	....	....	....
Wauseon	2,060	2	11.65	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	....	....	....	1	....	....	....	....	....	....	....
Wellington	2,169	6	33.35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	4	....	....	....	....	....	1	....	....	3	....	....	....
West Liberty	1,200	1	10.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wilmington	3,079	4	15.59	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	2	....	....	1	....	....	....	1	....	....	....	....	....	....
Winton Place	1,600	.....	.....	....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Wyoming	1,454	2	16.50	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....
Totals	194,465	310	19.13	37	25	58	16	2	4	....	2	....	1	1	4	4	....	10	2	51	12	23	161	10	13	10	16	8	23	15	1	56	21	11	25

The following villages report no deaths during February: McComb, Murray City, Patterson, Port Clinton, Summerfield.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF MARCH, 1895.

Eighty villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under 1 year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Ada	2,079	5	28.85	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	4	2	...	...	...	...	2	...	...	...	...	...	...
Archbold	780	1	15.38	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Ashtabula	8,338	18	25.90	4	6	10	1	...	...	...	1	...	...	7	...	1	...	...	...	1	...	1	4	...	3	1	...	...	...	...	...	...	2	1	1
Athens	2,640	2	9.42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	1	...	...	...
Avondale	4,473	10	26.83	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	3	7	...	...	1	...	...	...	2	...	...	4	...	...
Bedford	1,048	1	11.50	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bellefontaine	4,245	5	14.13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	1	3	...	...
Bellevue	3,052	3	11.79	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...
Berea	2,533	3	14.21	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...
Blanchester	1,196	2	20.07	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bridgeport	3,369	8	28.48	...	...	4	...	...	...	...	...	...	...	...	...	...	...	3	...	2	...	2	2	...	...	...	...	...	1	1	...	...	...	...	...
Brooklyn	4,585	2	5.34	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bryan	3,068	2	7.82	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...
Canal Dover	3,470	3	10.37	...	...	3	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Carthage	2,257	4	21.27	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	1	2	...	...	...	...	...	...	...	...	2	...	...	...
Clyde	2,327	3	15.47	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...
Conneaut	3,241	4	14.81	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	2	...	...	...	...	...	...	...	...	2	...	...
Coshocton	3,672	3	9.52	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	1	1	...	...	1	...	...
Cuyahoga Falls	2,614	2	9.18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	1	...	...	...	...	...	...
East Palestine	1,816	1	6.60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...
Elmore	1,198	1	10.01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
Elmwood Place	1,916	4	25.04	...	...	1	...	...	...	...	...	...	1	...	...	...	...	...	...	2	...	2	1	...	...	...	...	...	...	...	...	1	...	...	1
Fairview	170	1	70.58	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	...	...
Franklin	2,729	4	17.58	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	2	...	...	...	...	...	...	...	...	...	...	...	...
Geneva	2,194	1	5.47	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...
Germantown	1,437	1	8.35	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, ETC.—Concluded.

Eighty villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Glendale	1,441	3	24.93	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....
Glouster	2,600	1	4.80	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Hartwell	1,507	1	7.96	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Hicksville	2,141	3	16.81	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	1	....	....	....	....	....	....	1	....	....
Jackson	4,320	2	5.55	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Jamestown	1,104	5	54.34	2	3	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	1	....	....	1	....	....	....
Kent	3,510	7	23.93	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	3	....	....	....
Larue	948	1	12.66	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....
Leetonia	2,826	5	21.25	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	1	1	....	....	....	2	....	....	....	1	....	....	....
Lebanon	3,050	1	3.94	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	1	....
Linwood	1,291	2	18.59	2	1	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	1	....	....	1	....	....	....	....	....	....	3	....	....	1
Lockland	2,474	6	29.10	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	1	....	....	....	....	....	....	....	....	....	....	....	....
Loran	3,119	1	3.80	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Lorain	4,863	16	88.66	7	2	3	....	....	....	....	....	....	....	....	....	....	....	3	....	....	1	....	1	7	1	....	....	....	2	1	1	....	4	....	....	1
Lynchburg	763	2	31.45	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Manchester	1,965	3	18.32	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	....	1	....	1	....	1	....	....
Marysville	2,810	5	21.35	1	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	3	3	....	....	....	....	....	....	....	....	....	....	....	....	....
Medina	2,073	4	23.11	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....	1	....	....	1	....	....	1	....	....	....	....
Miamisburg	2,952	3	12.19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	2	....	....	....	1	....	....	....	1	....	....	....	....
Mingo Junction	2,408	8	14.95	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	2	....	1	....	....	....	....	....	....
Morristown	871	1	32.94	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	....	1	....	....	....	....	....	....
Murray City	2,518	1	4.77	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	1	....	1	....	....	....	....	....	1
New Lisbon	2,778	3	15.86	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....	....	....	1	....	1	....	....	....	....	....	....
New London	1,096	3	32.85	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....	....	....	....	....	....	....	1	....	....	....	....
N. Philadelphia	4,456	5	13.47	....	....	2	....	....	....	....	....	....	....	....	....	....	....	2	....	....	1	....	1	2	1	....	....	....	....	....	....	....	....	....	....	....
New Richmond	2,379	2	10.09	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....

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ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF APRIL, 1895.

Sixty-four villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Ada	2,079	5	28.85	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	3	...	...	...	...	...	...	...	...	3	...	...	...
Ashtabula	8,338	12	17.27	2	3	4	2	...	...	...	...	...	...	...	1	...	...	...	...	1	...	1	5	...	...	2	1	...	1	...	...	1	1	1	...
Athens	2,640	2	9.32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	...	1	...	...	...
Avondale	4,473	3	8.05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	1	...	2	...	...	...
Barnhill	969	2	24.77	...	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	1	1	...	2	...	...	...	...	...	1	...	...	...	...	...	...
Bellefontaine	4,245	5	14.13	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	2	...	...	...	...	...	1	...	...	1	...	1	...
Bellevue	3,052	4	15.73	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3	...	...	...	1	...	1	1	...	...	...	...	...
Berea	2,583	12	56.85	...	...	5	5	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	5	...	...	...	2	...	1	...	...	2	...	1	...
Blakes Mills	390	1	30.76	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bridgeport	3,369	3	10.68	2	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...
Brooklyn	4,585	1	2.62	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...
Bryan	3,068	2	7.82	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	2	...	2	...	...	...	...	...	...	...	...	...	...
Carthage	2,257	3	15.95	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...
Clyde	2,327	4	20.68	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	1	1	...	...	...	...	...	1	...	...	...	...	...	...
Conneaut	3,241	6	22.89	...	...	1	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	1	3	...	1	...	...	...	1	...	...	...	1	1	...
Coshocton	3,672	9	19.56	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	2	5	...	...	...	...	1	2	...	...	2	...	...	1
Cuyahoga Falls	2,614	3	13.17	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	1	...	...	1	1	...	...
Doylestown	1,131	4	42.44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	2	...	...	...	1	...	1	...	...	...	...	...	...
Elmwood Place	1,916	1	6.26	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	1
Fairport	1,171	3	30.74	3	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	1	...	...	1	...	...	...	...	...
Franklin	2,729	1	4.39	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Geneva	2,194	4	21.88	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...	...	1	...	...	1	...	2	...
Germantown	1,487	2	16.70	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Greenwich	881	1	13.62	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...
Hartwell	1,507	2	15.92	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	1	...	...	...	...	...	...	...	...
Jackson	4,320	1	2.77	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	2
Junction City	894	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Kent	3,510	3	10.25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	1	...	...	...	...	...	...	...	1	...
Larue	948	2	25.32	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	1	...	...	...	...	...	...
Lebanon	3,050	1	3 93	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Leetonia	2,826	3	12.74	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	2	...	...	...	...	1	...	...	...	1	...	...	...
Linwood	1,291	6	55.77	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	4	...	...	1	...	...	2	...	...	1	...	...	...

Lockland	2,474	6	29.10	1	1									1					1		1		4					1		3		1	1
Logan	3,119	6	23.08			1							1						1		1		4			1			3							
Lorain	4,863	9	22.18		2	5					1					4					3	1					1		1		1				
Lynchburg	763	2	31.45																		1						1					1			
Manchester	1,965	1	6 11																1	1												1			
McConnelsville	1,771	1	6.77																																	
Millersburg	1,923	4	24.96			1													1		1	2						1		1					
Montpelier	1,298	1	9.28																1		1														
Mt Pleasant	644	5	93.17		2	1	1															2					2							1
New Lisbon	2,278	3	15 79																2		2	1								1					
New London	1,096	1	10.95																1																
N. Philadelphia	4,456	5	11.22	1															2	1	1	3	1			1	1								
New Richmond	2,379	11	55.48	1															2	1	1	8				1	1			6		1	1		
New Straitsville	2,782	3	12.94	1	1	1													1	1		1					1								
North Amherst	1,648	4	29.12																1		1	3								3			1		
Norwood	4,500	3	8.00																1	1		2				1									
Oberlin	4,376	4	10.97																			3						2				1			
Painesville	4,755	9	22.71																1		1	5		1				1		3	1	2			
Reading	3,103	4	15.47		2	2	2																											2	
Riverside	2,169																																	2	
St. Bernard	1,779	1	6.75																														1		
Shelby	1,977	9	54.63	1	3	2	1						1						1	1		2								2	4				
Sidney	4,850	7	17.31																4	2	2	2								1		1			
Tippecanoe City	1,465	3	24.57																			3						1							
Uhrichsville	3,842	5	15.62																1		1	4	1					1		2					2
Union City	1,293	4	37.12	1															2	1	1	2		1						1					
Wadsworth	1,574	1	7 62																			1					1								
Wapakoneta	3,616	8	26.55																1	1		6	1			1		4				1			
Wellington	2,069	3	17.39	1															1		1	2	1			1									
Westwood	1,050	2	22 85																			1		1								1			
Wilmington	3 979	1	3 89	1																		1					1								
Winton Place	1,600	2	15.00	1																		2						1		1					
Totals	160,345	239	17.82	19	14	29	11	1				1		3	2	1		5		52	11	35	23	6	7	6	11	7	31	6		42	10	16	15		

The following villages report no deaths during April: Ashley, Centerburg, Cridersville, East Palestine, Glendale, Hicksville, Marysville, Morristown, Murray City, Napoleon, Patterson, Summerfield.

ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF MAY, 1895.

Fifty-four villages.	Population.	Total deaths, all causes.	Annual rate, per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Group and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexy.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Ada	2,079	1	5.77	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	4	...	1	...	1	2	...	...	...	...	3	1	...
Ashtabula	8,338	12	17.27	3	1	2	...	1	...	...	...	...	...	...	1	...	...	...	...	1	...	1	2	...	...	...	...	...	...	...	...	...	1	...	...
Athens	2,640	1	4.66	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	2	2	1	...	...	...	...	1	...	...	...	...	...	...
Avondale	4,473	5	13.42	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	3	1	2	2	1	...	...	...	...	1	...	...	...	...	...	...
Bellefoutaine	4,245	3	8.48	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	1	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Bellevue	3,052	3	11.79	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	...	...	1	...	1	...	...
Bridgeport	3,869	4	14.24	1	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	1	...	1	2	...	...	...	...	...	2	...	...	1	1	1	...
Bryan	3,068	3	11.73	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...
Carthage	2,257	1	5.19	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Clyde	2,327	6	30.94	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	2	4	1	...	...	...	1	...	...	...	...	...	...	...
Conneaut	3,241	5	18.51	...	...	3	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...
Coshocton	3,672	5	16.34	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	2	...	2	2	1	...	...	...	...	1	...	...	...	...	...	...
Cuyahoga Falls	2,614	2	9.18	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	1	...	...	...	...	...	...	...
Cygnet	670	2	35.82	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	...	...	...	...	1	...	...	...	...	...	...
East Palestine	1,816	1	6.60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Elmwood Place	1,198	1	10.01	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Felicity	779	2	30.81	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...
Franklin	2,729	4	17.56	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	3	...	...	...	...	...	2	...	...	...	...	...	...
Geneva	2,194	4	21.88	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	1	...	...	...	...	1	...	...	1	1	...	...
Hicksville	2,141	1	5.60	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
Jackson	4,320	4	11.08	...	...	1	...	...	1	...	...	...	...	...	...	...	...	...	...	3	...	3	...	...	...	...	...	...	...	...	...	...	...	...	1
Jamestown	1,104	1	10.87	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...
Kent	3,510	3	10.25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	2	...	...
Lebanon	3,050	1	3.94	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	...
Leetonia	2,826	5	21.25	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	1	...	...	2	...	...	...
Linwood	1,291	2	18.59	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	1	...	...	...	...	...	...	...	...	1	...	...	...
Lockland	2,474	3	14.55	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...
Logan	3,119	2	7.20	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	1	...	...	...	...	...	1	2
Lorain	4,863	17	41.95	1	3	4	...	...	...	...	...	...	...	...	1	2	...	1	...	2	...	2	9	2	2	...	1	...	2	...	...	2	2	...	...
Marysville	2,810	2	8.54	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	1	...	...	...	...	...	...	...	...	...	...	...
Manchester	1,965	2	12.22	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	1	...	1	...	...	...	...	...	...	...	...	...	...
Miamisburg	2,952	1	4.07	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

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ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF JUNE, 1895.

Sixty-one villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Ada	2 079	1	5.77	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	3	1	2	3	....	....	....	1	1	1	....	....	....	1	....	1
Ashtabula	8,898	9	12.95	1	....	2	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	1	....	....
Archbold	780	1	15 39	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....
Atheus	2 610	1	4 66	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....
Avondale	4,473	2	5.37	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Bedford	1,013	2	23.01	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....
Bellefontaine	4 245	2	5 65	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Bellevue	3,052	5	19 62	....	1	1	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	1	1	1	....	....	....	....	....	....	....	....	2	....	....
Bridgeport	3 369	2	7 12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	....	....	....	....	....	....	1	....	....	....	....	....
Brooklyn	4,588	2	5 24	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	....
Bryan	3 068	6	23.46	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	1	4	3	....	....	....	....	1	....	....	....	....	....	....
Carthage	2,257	3	15.57	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	....	....	1	....	....	1	....	....	....
Centerburg	588	1	20.41	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clyde	2,347	1	5 14	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....
Conneaut	3,241	4	11.72	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	1	1	....	....	....	....	....	1	....	....	....	....	....	....
Copley	241	2	99.58	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Coshocton	3,672	6	9 61	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	5	2	1	....	....	....	1	....	1	....	....	....	....
Cuyahoga Falls	2,614	4	18 36	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	3	....	....	....	....	....	....	....	....	....	....	1	....	....
East Palestine	1,816	3	19 80	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	2	....	....
Elmwood Place	1,198	4	10.04	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	....	....	2	....	....	....	....	....	....	1	....	....
Frankfort	667	1	17 89	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	1	....	....	....	....	....	....
Gahana	207	1	57.99	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....
Germantown	1,437	1	8 35	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Glendale	1,444	1	8 31	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....
Hartwell	1,507	1	7 96	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Hicksville	2,141	1	5.60	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....
Holgate	1,134	1	10.58	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Jackson	4,320	3	8 31	....	....	2	....	....	....	2	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Jacksonville	727	1	16 50	....	1	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Kent	3,510	8	27 35	....	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	2	....	1	....	....	....	....	....	....	1	4	....	1
Larue	948	1	12.66	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....
Lebanon	3,050	5	19.70	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	2	1	....	....	....	....	....	1	....	....	....	....	....	....

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ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF JULY, 1895.

Sixty-seven villages	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexy.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Ada	2,079	1	5.77	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Ashley	628	1	19 11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Ashtabula	8,338	10	14 89	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	1	6	....	....	....	3	2	1	....	....	1	1	....
Athens	2,640	5	23.30	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	....	....	....	....	1	....	....	....	....	....	2	....
Avondale	4,473	5	13.42	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	2	1	1	2	....	....	....	....	....	1	....	....	....	....	....	....
Bedford	1,043	2	23.01	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....
Bellefontaine	4,245	14	39.58	2	....	3	....	1	1	....	1	....	....	....	....	....	....	....	....	3	....	3	4	....	....	....	....	1	....	....	....	1	2	....	2
Bridgeport	3,369	4	14.24	....	1	2	....	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	2	....	....	....	....	....	....	1	....	1	....	....	....
Brooklyn	4,585	2	5.24	....	....	2	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Bryan	3,068	2	7.82	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	1	....	....	....	....	....
Carthage	2,257	1	5.19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Centerburg	588	2	40 82	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clyde	2,327	2	10.28	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	1	....	....	....	....	....
Conneaut	3,241	3	11 44	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	1	....	....	....	....	....	....	....	....	....	....	1	1
Coshocton	3,672	5	16.34	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	3	....	3	1	....	1	....	....	....	....	....	....	....	....	1	1
Cridersville	465	4	103.22	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....	....	....
Cuyahoga Falls	2 614	3	13 17	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	2	....	....
Cygnet	670	1	17.91	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....
De Graff	1,076	2	22.30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	2	....	....	....	....	....	....
East Palestine	1,816	3	19.80	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	1	....	....	....	....	....	....	....	....	....	....	1
Elmwood Place	1,198	4	40.04	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	3	....	....	....	....	....	....	1	....
Fairport	1,171	5	51.24	2	3	3	1	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	1	....
Felicity	779	1	15.40	1	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin	2,729	3	13.17	1	1	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Germantown	1,437	3	25.05	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Hicksville	2,141	2	11.20	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....
Holgate	1,134	1	10.58	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Jackson	4,320	4	11.08	....	....	2	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	....	....
Jacksonville	727	2	33.01	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	....	....	....	....	....	....
Kent	3,510	2	6.95	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	1	....	....	....	....	....	....	1	....	....
Lebanon	3,050	3	10 82	1	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....
Leetonia	2,826	6	25.48	2	....	2	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	1	1	....	....	....	....	....	....	....	....	1	....
Linwood	1,291	3	27.88	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	....	....	....	1	....	....	....	....	....	1	....

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ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF AUGUST, 1895.

Seventy-three villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Ada	2,079	1	5.77	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ashley	628	1	19.11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....
Ashtabula	8,338	16	23.38	4	4	8	1	6	....	....	....	....	....	....	....	....	....	....	....	2	1	1	5	1	1	....	1	....	2	....	....	....	1	....	1
Athens	2,640	2	6.59	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Avondale	4,473	4	10.73	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	2	....	....	....	....	....	1	1	....	....	1	....	....
Beaver Dam	397	3	90.69	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	....	1	....	....	....	....
Belle Centre	927	3	38.83	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	1	....	....	....	1	....
Bellefontaine	4,245	11	31 09	....	4	3	....	....	....	....	....	3	....	....	....	....	....	....	....	2	....	2	4	....	1	....	....	1	....	....	....	2	1	1	....
Bellevue	3,052	6	23.58	1	1	2	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	1	....	1	....	....	....	1	1	....	....	....
Blanchester	1,196	2	20 07	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Bridgeport	3,769	3	10 68	....	....	2	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	1
Bryan	3,068	2	7 82	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....
Cannelville	177	1	67.79	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Carthage	2,257	2	10 38	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Centerburg	588	2	40.82	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cliff'n, Ham. Co	1,573	1	7.61	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....
Clyde	2 327	5	25 78	2	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	....	....	....	1	1	....
Conneaut	3,241	6	22.88	3	....	5	....	2	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Coshocton	3,672	9	29.19	....	....	4	....	....	....	....	1	....	....	....	2	....	1	....	....	1	....	1	3	1	1	....	....	1	....	....	....	....	1	....	2
Cridersville	465	1	25.80	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cuyahoga Falls	2,614	4	18.36	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	3	....	....	1	....	....	2	....	....	....	....	....	....
De Graff	1,076	3	33.46	....	1	2	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1
East Palestine	1,816	4	26 43	1	1	2	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....	....	....	....	....	1	....
Elmwood Place	1,198	3	30.05	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	1	1	1	....	....	....	....	....	....	....	....	....	....	1
Felicity	779	4	61.61	....	....	2	....	....	....	....	2	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	....	....	....	....	....	....	....	....	....
Frankfort	667	2	35 53	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	1	....	....	....	....	....
Franklin	2,729	4	17.85	1	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	1	....	2	1	....	....	....	....	1	....	....	....	....	....	....
Hartwell	1,507	1	7.96	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	....	....	....	....	....	1
Hicksville	2.141	5	28.02	....	....	3	....	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	2	....	....	....	....	....	2	....	....
Holgate	1,134	1	10.58	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Jackson	4,320	8	22.16	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	2	....	....	....	....	....	....	....	....	....	2	1	....
Jacksonville	727	.....	.....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1

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ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF SEPTEMBER, 1895.

Sixty-eight villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year	Total zymotic diseases.	Croup and diphtheria	Cholera infantum.	Cerebro-spinal meningitis	Cholera morbus.	Diarrhœal dis-ases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional dis-eases	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental dis-eases.	Total violence.	Premature and still births.
Ada	2,079	2	11.54	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Ashley	628	1	19.11	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....
Ashtabula	8,338	10	14.39	5	....	4	....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	1	....	1	....	....	3	2	....
Athens	2,640	3	13.64	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	....	....	1	....	1	....	....	....	....	....	....	....
Avondale	4,478	2	5.87	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	....	....	....	....	1	....	....	....	....	....	....
Beaver Dam	397	1	30.23	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Bedford	1,043	1	11.50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Bellevue	3,052	6	23.58	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	1	....	....	....	....	1	2	....	....
Bellefontaine	4,245	5	14.13	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....
Berea	2,533	9	42.63	2	1	5	1	3	....	....	....	....	1	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	1	....	....	....	1	1	....
Bridgeport	3,369	2	7.12	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Brooklyn	4,585	2	5.24	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....
Bryan	3,068	2	7.82	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1	....	....
Carthage	2,257	3	15.95	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....
Centerburg	588	2	40.82	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clifton, Ham. Co	1,575	2	15.22	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	....	....	....	....	1	....	....	....	1	....	....
Clyde	2,327	5	25.78	2	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	2	....	....	....	....	....	....	....	....	1	....	1
Conneaut	3,241	9	33.29	3	....	3	....	2	....	....	....	....	....	....	....	....	1	....	....	....	....	....	5	1	....	....	....	....	4	....	....	....	....	1	1
Coshocton	3,672	4	13.07	....	....	2	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....
Cuyahoga Falls	2,614	3	13.00	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....
DeGraff	1,076	1	11.15	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
East Palestine	1,816	2	13.22	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	1	....	....	....	....	....	....	....	....
Elmwood Place	1,198	3	30.05	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	2	....	1	....	....	....	....	....	1
Frankfort	667	1	14.77	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Franklin	2,729	2	8.93	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Glendale	1,444	1	8.31	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Green Spring	910	1	13.18	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hartwell	1,507	1	7.96	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Hicksville	2,141	4	22.40	2	....	1	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	2	....	....	1	....	....	....
Holgate	1,134	1	10.58	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Jackson	4,320	5	13.89	....	....	3	....	1	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	1	....	....	....	1	....	....	....	....	....	1
Jacksonville	727	1	16.50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....

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ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF OCTOBER, 1895.

Sixty-nine villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Ashley	628	2	38.21	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Ashtabula	8,338	19	27.34	2	1	8	3	....	1	....	....	....	....	....	....	....	3	....	....	5	....	5	4	....	....	....	2	....	....	....	....	2	1	1	3
Bellefontaine	4,245	1	2.83	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Bellevue	3,052	3	11.79	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	....	....	....	1	....	1	....	1
Belmont	384	5	156.25	....	....	5	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Bridgeport	3,369	6	21.40	1	....	3	....	1	....	....	....	....	....	....	....	....	1	....	....	2	1	1	1	....	....	....	....	....	1	....	....	....	1	....	....
Bryan	3,068	6	23.46	....	....	2	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
Cannelville	177	3	203.39	3	....	3	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Carthage	2,257	3	15.95	....	....	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	1	1
Centerburg	588	1	20.41	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Chagrin Falls	1,243	3	28.95	....	....	3	....	....	....	....	....	1	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clyde	2,327	2	10.31	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	....	....	....	....	....	....	....	....	....	1
Conneaut	3,241	1	3.70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....
Coshocton	3,672	8	26.16	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	1	1	5	1	1	....	....	1	1	....	....	....	....	....	....
Cuyahoga Falls	2,614	6	27.54	....	....	3	....	....	....	....	....	....	2	....	....	....	....	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	2	1	....
DeGraff	1,076	3	33.46	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....
East Palestine	1,816	2	13.22	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	1
Elmwood Place	1,198	4	49.08	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	1	....	1	....	....	....	....	....	....	....	....	....
Felicity	779	1	15.47	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....
Franklin	2,729	4	17.58	....	....	2	1	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	1	1	....	....	....	....	....	....	....	....	....	....	....
Glendale	1,444	2	16.62	....	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....
Glouster	2,500	5	24.00	....	....	2	1	....	....	....	....	....	....	....	....	....	....	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	2	1
Hartwell	1,597	1	7.96	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Hicksville	2,141	4	22.40	2	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	2	....	2	1	....	....	....	1	....	....	....	....	....	....	....	1
Holgate	1,134	3	31.74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Jackson	4,326	9	25.00	....	....	2	....	1	....	....	....	....	....	....	....	....	....	1	....	....	4	1	3	3	1	....	....	....	....	....	1	....	....	....	....	2
Kent	3,510	5	20.51	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	2	....	2	1	....	....	....	....	....	1	....	....	....	....	2	....
Larue	948	1	12.66	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Lebanon	3,060	4	15.74	1	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....
Leetonia	2,826	4	16.98	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	1	....	....	....	....	1	1	....
Lockland	2,474	4	19.40	2	1	2	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	1	....	....	....	2	....	....	....
Logan	3,119	2	7.70	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1	....
Lorain	4,863	21	51.82	5	2	4	....	1	....	....	....	....	....	....	2	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....

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ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF NOVEMBER, 1895.

Sixty villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera Infantum.	Cerebro-spinal meningitis	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Ashtabula	8,338	11	15.83	.....	1	3	1	.....	.....	.....	.....	1	.....	.....	.....	1	.....	1	.....	1	1	.....	6	1	1	1	.....	.....	2	.....	.....	1	1	.....	.....
Beaver Dam	397	2	60.30	.....	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bellefontaine	4,245	7	19.79	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	2	.....	2	4	2	1	.....	.....	.....	1	.....	.....	.....	.....	1	.....
Bellevue	3,052	5	19.66	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	3	.....	.....	.....	1	.....	1	.....	.....	1	.....	.....	.....
Bloomingburg	638	2	37.62	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bridgeport	3,369	8	28.59	2	...	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	1	2	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....
Brooklyn	4,585	1	2.62	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Bryan	3,068	1	3.91	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Centerburg	588	1	20.41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Chagrin Falls	1,243	1	9.65	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clifton, Ham. Co	1,575	1	7.62	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
Clyde	2,327	5	25.78	.....	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	3	.....	1	.....	.....	.....	.....	1	.....	.....	4	.....	.....
Conneaut	3,241	9	33 29	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	7	.....	1	.....	.....	.....	2	.....	.....	.....	1	1	.....
Coshocton	3,672	5	16.34	.....	...	3	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....
Cuyahoga Falls	2,614	4	18 36	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	1	1	.....
E. Palestine	1,816	3	19.82	2	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....
Elmwood Place	1,198	1	10.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin	2,729	2	8.79	1	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....
Glendale	1,444	2	16 62	.....	1	2	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hicksville	2,141	8	44.80	2	.....	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	4	.....
Jackson	4 320	5	13.89	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	2	.....	.....	1	.....	1	.....
Kent	3,510	8	27.35	.....	.....	3	.....	.....	.....	.....	.....	.....	1	.....	1	.....	2	.....	.....	2	2	.....	3	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
Lebanon	3,050	2	7.87	..	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leetonia	2,826	4	16.98	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1
Lockland	2,474	4	19.40	2	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	1	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Logan	3,119	2	7.70	..	1	1	...	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....
Lorain	4,863	13	37.08	2	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	4	1	3	5	.....	.....	.....	.....	1	2	1	..	.....	2	1	.....
Manchester	1,965	5	30.53	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	.....	.....	.....	.....	.....	1	.....	.....	2	.....	.....	.....
Marysville	2,810	3	12.81	.....	..	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	..	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Miamisburg	2,952	8	32.52	...	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....	1	1	.....	3	.....	.....	.....	.....	.....	2	.....	.....	.....	1	.....	.....
Millersburg	1,923	3	18.72	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	.....	1	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mingo Junction	2,408	1	4.98	.....	1	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....

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ABSTRACT OF THE REPORTS OF DEATHS AND THEIR CAUSES IN THE FOLLOWING VILLAGES OF OHIO, DURING THE MONTH OF DECEMBER, 1895.

Sixty-one villages.	Population.	Total deaths, all causes.	Annual rate per 1,000.	Total under one year.	Total under five years and over one year.	Total zymotic diseases.	Croup and diphtheria.	Cholera infantum.	Cerebro-spinal meningitis.	Cholera morbus.	Diarrhœal diseases.	Dysentery.	Malarial fevers.	Measles.	Puerperal fever.	Scarlet fever.	Tonsilitis.	Typhoid fever.	Whooping cough.	Total constitutional diseases.	Cancer.	Phthisis pulmonalis.	Total local diseases.	Apoplexia.	Bright's disease.	Bronchitis.	Convulsions.	Gastritis and peritonitis.	Heart disease.	Meningitis.	Pleurisy.	Pneumonia.	Total developmental diseases.	Total violence.	Premature and still births.
Archbold	780	2	11.54	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	1	....	....	....	....	1	....	....
Ashtabula	8,338	19	27.34	5	4	10	6	....	....	....	....	....	....	....	....	2	1	....	1	2	1	1	2	....	1	....	....	....	1	....	1	3	....	1	1
Bedford	1,043	1	11.50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....
Bellefontaine	4,245	8	22.62	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	6	....	2	....	....	....	2	....	....	2	....	1	....
Bellville	941	2	25 50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	1	....	1	....	....	....	....	....	....	....	....	....	....
Blanchester	1,196	1	10.03	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Bridgeport	3,369	5	17.81	1	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Brooklyn	4,585	1	2.62	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....
Bryan	3,068	3	11 73	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	2	....
Cadiz	1,716	4	27.97	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	....	....	1	1	....	....	....	....	1	....
Centerburg	588	2	40.82	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Clyde	2,327	3	15.47	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	1
Conneaut	3,241	3	11.10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	2	....	....	....	....	....	....
Coshocton	3,672	2	6.54	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	....
Cuyahoga Falls	2,614	4	18.36	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	2	1	....
De Graff	1,076	1	11.15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....
East Palestine	1,816	2	13.22	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Elmwood Place	1,198	3	30.05	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....
Felicity	779	2	30.94	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	1	....	....	....
Frankfort	667	1	14.77	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Franklin	2,729	3	13.19	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	1	....	....
Glendale	1,444	1	8.31	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....
Hartwell	1,507	3	23.88	....	....	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Hicksville	2,141	2	11.20	....	2	1	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Jackson	4,320	9	25.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	6	....	1	1	....	....	2	....	....	....	1	1	....	....
Jacksonville	727	1	16.50	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....
Junction City	394	2	60.91	....	1	1	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Kent	3,510	8	27.35	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	7	2	....	1	....	....	....	2	....	....	1	....	....	....
Lebanon	3,050	3	11.47	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	1	1	....	1
Leetonia	2,826	6	25.46	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	1	5	....	2
Linwood	1,291	3	27.87	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	2	....	....	....	....	....	1	....	....	....	1	....	....	....	....
Lockland	2,474	4	19.40	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	2	....	....	....	....	....	1	....	....	....	....	1	....	....

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Summary of Mortality Reports.

The total number of deaths reported from all causes—excluding premature and still-births—by the towns represented in the foregoing tables was 24,717. The average population of the cities and town represented was 1,406,434, which is equal to an annual death rate of 17.57 per thousand living population represented.

The deaths in 1,372,133 living population in 1894 were 23,993, equal to an annual death rate of 17.48 per thousand; while in 1893 the total number of deaths reported in 1,361,945 population was 23,794, equal to a mortality rate of 17.43 per thousand.

The number of deaths reported each month was as follows:

January	2,122	July	2,328
February	2,190	August	2,150
March	2,263	September	2,042
April	2,040	October	2,066
May	1,887	November	1,925
June	1,772	December	1,932

The greatest number of deaths (2,328) was reported in July; the least number (1,772) in June.

DEATHS OF CHILDREN UNDER FIVE YEARS OF AGE.

The number of deaths reported of children under five years of age (premature and still-born excluded), was 7,151, which is equal to 29 per cent. of the deaths from all causes, and a death rate of 5.08 per thousand population represented. The death rate of children under five the preceding year was 6.38 per thousand population represented.

The deaths by months, of children under five, were as follows:

January	573	July	929
February	544	August	790
March	583	September	748
April	448	October	660
May	445	November	514
June	422	December	495

The greatest number of deaths reported in children under five (929) was in July; the least number (422) was in June.

ZYMOTIC DISEASES.

The total number of deaths reported from zymotic diseases was 4,676, which is equal to 19 per cent. of the deaths reported from all causes, and an annual rate of 3.32 per thousand of the population represented.

The number of deaths reported the preceding year from zymotic diseases was 5,447, equal to a death rate of 3.97 per thousand population represented.

The number of deaths reported from zymotic diseases each month was as follows:

January	373	July	659
February	305	August	674
March	319	September	572
April	240	October	232
May	261	November	383
June	282	December	376

The month having the greatest number reported (674) was August; the one having the least (232) was October.

CROUP AND DIPHTHERIA.

The total number of deaths reported from croup and diphtheria was 864, which is equal to 3.50 per cent. of the deaths reported from all causes, and a death rate of .62 per thousand of the population represented.

The number of deaths reported the preceding year from these causes was 981, equal to a mortality rate of .72 per thousand of the population represented.

The number of deaths reported each month from croup and diphtheria was as follows:

January	75	July	33
February	72	August	31
March	45	September	53
April	37	October	168
May	46	November	148
June	29	December	127

The month having the greatest number reported (168) was October; the one having the least number (29) was June.

CHOLERA INFANTUM, CHOLERA MORBUS AND DIARRHŒA.

The total number of deaths reported from cholera infantum, cholera morbus and diarrhœa was 1,321, which is equal to 5.34 per cent. of the deaths reported from all causes, and a mortality rate of .93 per thousand population represented.

The number of deaths reported the preceding year from these causes was 1,527, which is equal to a mortality rate of 1.11 per thousand of the population represented.

The deaths, as reported by months, were as follows:

January	18	July	410
February	20	August	366
March	30	September	258
April	21	October	73
May	26	November	26
June	57	December	16

The month having the greatest number reported (410) was July; the month having the least (16) was December.

MEASLES, SCARLET FEVER AND WHOOPING COUGH.

The total number of deaths reported from measles, scarlet fever and whooping cough was 547, which is equal to 2 21 per cent. of the total number of deaths reported from all causes, and a mortality rate of .39 per thousand of the population represented.

The total number of deaths reported from these diseases during the preceding year was 965, equal to a mortality rate of .7 per thousand population represented.

The deaths, as reported by months, were as follows:

January	74	July	36
February	47	August	43
March	65	September	23
April	40	October	33
May	52	November	27
June	55	December	52

The month in which the greatest number of deaths was reported (74) was January; the least number (23) was reported in September.

TYPHOID FEVER.

The total number of deaths reported from typhoid fever was 776, which is equal to 3.14 per cent. of the total number reported from all causes, and a mortality rate of .55 per thousand population represented.

The number of deaths reported from this cause the preceding year was 709, equal to a mortality rate of .51 per thousand living population represented.

The number of deaths from typhoid fever, as reported by months, was as follows:

January	49	July	36
February	61	August	61
March	45	September	111
April	34	October	162
May	28	November	84
June	32	December	73

The greatest number of deaths (162) was reported in October; least number (28) in May.

CONSTITUTIONAL DISEASES.

The total number of deaths reported from constitutional diseases was 4,437, which is equal to 15 9 per cent. of the deaths reported from all causes, and a mortality rate of 3 15 per thousand population represented.

The number of deaths reported from constitutional diseases the preceding year was 4,185, equal to a mortality rate of 3.05 per thousand population represented.

The number of deaths, as reported by months, was as follows:

January	395	July	385
February	396	August	337
March	400	September	312
April	459	October	361
May	396	November	319
June	344	December	333

The greatest number of deaths (459) was reported in April; the least number (312) was reported in September.

CANCER.

The total number of deaths reported from cancer was 830, which is equal to 3.4 per cent. of the deaths reported from all causes, and a mortality rate of .59 per thousand population represented.

The number of deaths reported from this cause the preceding year was 783, equal to a mortality rate of .57 per thousand population represented.

The deaths, as reported by months, were as follows:

January	62	July	66
February	99	August	71
March	59	September	59
April	68	October	79
May	60	November	79
June	66	December	62

The month having the greatest number reported (99) was February; the months having the least (59) were March and September.

CONSUMPTION.

The total number of deaths reported from consumption was 2,871, which is equal to 11.62 per cent. of the deaths reported from all causes, and a mortality rate of 2 04 per thousand population represented.

The number of deaths reported from this cause the preceding year was 2,712, equal to a mortality rate of 1.97 per thousand population represented.

The number of deaths, as reported each month, was as follows:

January	258	July	240
February	247	August	209
March	285	September	201
April	310	October	230
May	267	November	190
June	219	December	215

The greatest number of deaths was reported in April (310), the least number (190) in November.

LOCAL DISEASES.

The total number of deaths reported from local diseases was 11,055, which is equal to 44.72 per cent. of the deaths reported from all causes, and a mortality rate of 7.86 per thousand population represented.

The number of deaths reported from local diseases the preceding year was 10.698, equal to a mortality rate of 7.79 per thousand population represented.

The deaths, reported by months, were as follows:

January	1,068	July	865
February	1,169	August	759
March	1,204	September	711
April	1,047	October	759
May	889	November	850
June	818	December	916

The month having the greatest number of deaths reported (1,204) was March; the one having the least number (711) was September.

BRONCHITIS, PLEURISY AND PNEUMONIA.

The total number of deaths reported from bronchitis, pleurisy and pneumonia was 2,914, which is equal to 11.79 per cent. of the deaths reported from all causes, and a mortality rate of 2.07 per thousand of the population represented.

In the preceding year there were 2,828 deaths reported from these causes, equal to a mortality rate of 2.06 per thousand population represented.

The deaths, as reported by months, were as follows:

January	336	July	126
February	432	August	92
March	484	September	95
April	340	October	168
May	171	November	251
June	163	December	256

The month in which the greatest number of deaths was reported was March (484); the least number (92) was reported in August.

CONVULSIONS AND MENINGITIS.

The total number of deaths reported from convulsions and meningitis was 1,719, which is equal to 6.96 per cent. of the deaths reported from all causes, and a mortality rate of 1.22 per thousand population represented.

The number of deaths reported from these diseases the preceding year was 1,554, equal to a mortality rate of 1.13 per thousand population represented.

The deaths, as reported by months, were as folllows:

January	157	July	176
February	150	August	160
March	178	September	125
April	142	October	127
May	152	November	111
June	126	December	115

The greatest number of deaths was reported in March (178); the least number (111) in November.

DEVELOPMENTAL DISEASES.

The total number of deaths from developmental diseases reported (excluding premature and still-births) was 2,138, which is equal to 8.65 per cent. of the deaths reported from all causes, and a mortality rate of 1.52 per thousand population represented. During the preceding year there were 1,851 deaths reported from developmental diseases, equal to a mortality rate of 1.35 per thousand population represented.

The deaths, as reported by months, were as follows:

January	187	July	192
February	188	August	185
March	199	September	174
April	153	October	171
May	165	November	193
June	154	December	180

The greatest number of deaths (192) was reported in July; the least number (153) in April.

PREMATURE AND STILL-BIRTHS.

The total number of premature and still-births reported was 1,858, which is equal to 7.52 per cent. of the deaths reported from all causes, and a rate of 1.32 per thousand population represented.

During the preceding year there were 1,994 premature and still-births reported, equal to a rate of 1.45 per thousand population represented.

The premature and still-births, as reported by months, were as follows:

January	183	July	164
February	180	August	161
March	169	September	160
April	144	October	143
May	147	November	118
June	131	December	163

The greatest number (183) was reported in January; the least number (118) was in November.

VIOLENCE.

The total number of deaths reported from violence was 1,323, which is equal to 5.35 per cent. of the deaths reported from all causes, and a mortality rate of .94 per thousand population represented.

During the preceding year there were 1,204 deaths reported from violence, equal to a mortality rate of .88 per thousand population represented.

The deaths, as reported by months, were as follows:

January	78	July	145
February	89	August	143
March	86	September	132
April	92	October	130
May	101	November	117
June	108	December	111

The greatest number of deaths was reported in July (145); the least number (78) in January.

APPENDIX I.

PROCEEDINGS OF A MEETING

OF THE

State Board of Health,

AND

LOCAL BOARDS OF HEALTH OF OHIO,

HELD IN

Columbus, Ohio, January 30 and 31, 1896.

REPORT OF PROCEEDINGS

OF THE

Sixth Annual Convention of Ohio Boards of Health

HELD AT

Columbus, Ohio, Thursday and Friday, January 30 and 31, 1896.

MORNING SESSION.

THURSDAY, *January* 30, 1896.

The convention was called to order at 1:30 o'clock P. M., by the President, Dr. S. P. Wise, in the auditorium of the Y. M. C. A. Building, who at once proceeded to deliver the president's address, as follows:

OFFICERS OF HEALTH, MEMBERS OF LOCAL BOARDS, LADIES AND GENTLEMEN:—In the name of the State Board of Health I extend to you a cordial greeting. I esteem it a high honor to preside over your honorable body, but I cannot refrain from expressing the feeling of unworthiness and diffidence with which I assume the task. It affords us great pleasure to see so many of you present. The interest manifested by your presence betokens that the annual convention of local boards and the officers of health in Ohio, has come to stay. It was the first state in the Union to organize such an association, and being the pioneer in this line of work is a great honor to its members, and its success must be as gratifying to you as it is to the State Board of Health. It is unnecessary to state the object of this meeting. Suffice to say, that we regard it as virtually your own convention. While we are willing to take part in your deliberations, yet our chief object and desire is more especially to be attentive listeners and thereby to obtain the benefit of your knowledge and experience.

The experience of health officers and members of local boards, bears the same relation to sanitary science, and is of the same practical value as is the bed side experience of the practitioner to medical science. In pursuing their official duties they have opportunities of observing the various conditions and circumstances in the environments of the human family which are prejudicial to health and propagate disease. They observe the influence of contagion and learn to recognize the causes which intensify it, and often trace it in its subtle course to its primary origin. In other words they possess themselves of a practical knowledge which often sets to naught all abstract theories, and which after all, is the chief aim and end of all human learning. Many of the sanitary problems will never be solved in the chemist's laboratory, nor by means of the culture fluid and the microscope of the bacteriologist. With all due respect to our most eminent scientists, we sometimes find them having very crude ideas of prac-

tical sanitation. For instance—I was amused sometime ago in reading an article by Prof. Koch, on the subject of water pollution. When I noted by whom the article was written, I congratulated myself on having secured a valuable prize. Judging from the world-wide reputation of its author, I thought I had in my possession the ultimatum of all human knowledge on the subject. After discussing the question of river pollution and municipal supplies, etc., at some length, he took up the subject of wells, and suggested how wells located in towns and cities might be protected, so as to render their waters potable and free from danger. His suggestion was that an arch of stone or brick should be built about three or four feet from the bottom of the well, thus forming a reservoir, after which the well should be filled up with earth to the level of the surface, the pump of course remaining in position. In his opinion, this procedure would obviate all danger of pollution. Now here is a sanitary opinion of one of the most illustrious scientists of the age in which we live. The man who has immortalized himself by his ingenious discoveries in bacteriological technique. The man who identified the bacilli of cholera and tuberculosis. The man who can distinguish the various germs of disease as clearly as we can tell one species of domestic animals from another, yet with all due respect for his fair fame we cannot agree with him on the question of well pollution.

The wide-spread diffusion of enteric fever throughout the State, both in towns and villages, as well as in the rural districts, during the last season, is a subject worthy of consideration at this time. I think we are fully warranted in the conclusion, that the disease is by no means always due to a specific organism which is communicated from one person to another. Such a theory appears preposterous to any one who has had opportunities of observing outbreaks of the disease as they occur in the rural districts. I do not wish to obtrude my opinion upon those among you who hold to the theory of specific contagion, but I take the liberty of offering the explanation, which to my mind, seems most tenable and is substantiated by my own personal observation. The continued drouths which have prevailed during the last year, and in fact, for several years past, lowered the ground-water level to such an extent as to reduce the water in wells to a minimum. The result was that what little water remained in the wells in many instances became stagnant, and the organic matter contained therein was reduced to a high state of concentration, and constituted a perfect hot-bed for bacterial life. A bacteriological examination of such water would no doubt reveal bacteria in great abundance and we would find them in a state of great activity. The result is that the simple microbe which so far has led a saprophytic existence is transformed into a parasite. In other words, the innocent germ becomes a disease producing germ. There may be factors which contribute to this process of transmutation with which we are as yet unacquainted. I do not wish to enter into an extended discussion of this subject, as it more properly belongs to the science of medicine. I merely call attention to the sanitary aspect of the question and desire to impress the conclusion that typhoid fever may as surely be caused by any nuisance existing in the vicinity of a water supply which pollutes the water with decomposing organic matter, as by the dejections of a fever patient which may gain access to it.

One of the greatest problems that confronts us to-day is, how shall we obtain and maintain a pure water supply. It is self-evident that filtration is the only solution to the problem, and that many of our cities and towns will soon be obliged to resort to some method of filtration in order to arrest the rapidly increasing ravages of water-borne diseases. Now, nature teaches us precisely how to do this. The value of filtration through sand has, until recently, been under-estimated. The researches of chemists and bacteriologists have shown that filtration through sand and gravel can be made more perfect than through charcoal. It has been demonstrated that a fresh sand-filter acts merely mechanically, and only prevents the passage of grosser particles; but a filter some time in use has its superficial layers permeated with a jelly-like mass of microbes, which acts as a real filter. These microbes convert the nitrogen of the organic matter into nitrates, and the nitrates arrest the further passage through the filters of other

microbes. I can conceive that a point of saturation may be arrived at, but I have no information on this point. The question suggests a line of scientific experimentation which would elicit most valuable knowledge, and should be undertaken by the sanitary authorities at as early a date as possible. The best authority we have on the subject at present are the researches of Dr. Percy Frankland, of England. The rule laid down by Dr. Frankland for the construction of a filter bed is, that the layer of sand should not be more than thirty centimetres in thickness, and that the rate of flow of water through the sand should be uniformly four inches per hour. He further states that sand particles averaging 0.06 of an inch in diameter allowed from twenty-six to forty per cent. of the bacteria to pass through; whilst sand grains averaging 0.006 of an inch, permitted fourteen per cent. to pass through. When very fine sand (silver sift) five feet in depth was used ninety-five per cent. of the microbes were retained.

Wholfhügel found that the 3 000 colonies per cubic centimetre found in unfiltered Berlin water were reduced by filtration to 107. Koch claims that good water should contain no more than fifty microbes to the cubic centimetre.

The fitness of water for potable purposes is generally determined by chemical analysis, and rarely by its biological examination. It is, however, clear that both methods are desirable, and if one or the other is to be dispensed with, undoubtedly the biological examination is the most important. The line which divides a bad from a good water has, unfortunately, not yet been determined by chemical analysis. Water that contains very little organic matter may be dangerous to drink, whilst on the contrary, water with a large amount of organic matter has been drank with impunity for years.

The local government board of England, in their eleventh annual report, give an account of a test which was made by them which shows the failure of detecting a limited degree of pollution of water by chemical analysis. A certain quantity of typhoid dejections was added to a litre of pipe water, and half that quantity of the dejection to another litre of water. Both, together with unpolluted water, were analyzed by distinguished chemists, who were not aware of the nature of the specimens submitted to them. Omitting all detail, the result was that they found both the free and albuminoid ammonia increased corresponding with the degree of pollution, but the analysis did not show sufficient deleterious matter to condemn the water in the estimation of the chemists. Chemical analysis certainly shows the amount of organic matter present, and as a rule the larger the percentage of nitrogen contained in the organic matter the more likely it is to have been derived from an animal source. It is unfortunate, however, that there is no accurate chemical method for determining the precise nature of the organic matter found. It is clear, then, that in addition to a chemical analysis, the number of microorganisms contained in the water should be determined, and without such knowledge our estimates of its purity will always be more or less inaccurate. The State Board of Health has had this matter under consideration for a number of years past, and the only reason we have not made the necessary arrangements for such biological examinations is the want of funds. The necessity for a laboratory of hygiene in connection with the Board is apparent to anyone who is interested in the sanitary welfare of our State. The benefits that would accrue from such a department would be of inestimable value, and the money invested in its establishment and maintenance would bring larger returns than any other investment that the State could make for the benefit of the people.

There are many evils in existence which have a direct bearing upon the health and mortality of the people of our commonwealth which can only be corrected by judicious legislation. Some of them will never be abated unless by a united effort on the part of the sanitarians and health boards of the State, aided by the political economists, and such philanthropists whose pecuniary resources enable them to gratify their benevolent instincts. Notably among the evils referred to is the social condition of the poor in our large cities. It is a significant fact that when we point out the excessive mortality to a resident of one of our large cities, we are met with the statement that the vast majority of the deaths have occurred among the lower classes, in the slums of the city. That

this is true and is universally the case is fully supported by statistical evidence. As we have no reliable statistics in this country we are obliged to go across the water for our data. In the city of Dublin, Ireland, in 1893, the death rate of children under five years of age among the better class of the population, was 19.5 per thousand; the middle class had a death rate of the same age of 43 4 per thousand, whilst the poorer class had a mortality of 104 per thousand. It must be noted, however, that this excessive mortality is compensated for by a corresponding high marriage and birth rate. Were this not the case they would soon become extinct, but this fact by no means relieves the onus of such an appalling mortality. Some writer commenting on this deplorable state of affairs says, "The poorer a man is the more likely he is to marry, and it is a remarkable but undeniable fact that a man's desire for matrimony is in the inverse proportion to his ability to maintain a family." The problem how to avoid this flagrant destruction of human life is of momentous import and its solution should engage the attention of every humanitarian. The causes are no doubt highly complex, but some of them are easily discoverable—such as over-crowded and ill-ventilated dwellings; defective drainage; accumulations of filth; noxious effluvia from factories and workshops; cold and damp tenement, with insufficient sun light; insufficient clothing; insufficient and improper food, amounting to semi-starvation, etc. It is not alone the infective diseases which destroy these people but they are susceptible to various constitutional maladies which often terminate their lives many years before the expiration of the allotted period of human existence. Now, the fact is, that a city which tolerates such unsanitary conditions within its precincts is guilty of maintaining a colossal nuisance. We find them often located within a few minutes walk of the most prominent streets and avenues, almost within a stone throw of the most elegant mansions. It is evident that it is in the dwellings of these lower classes that the seeds of infectious diseases are nursed as if in a hot-bed, they are veritable pest-spots and are a constant menace to all the rest of the inhabitants of the city.

In conclusion, gentlemen, this meeting marks the tenth anniversary of the State Board of Health. A retrospective view of the progress of sanitation in Ohio would alone constitute a theme for an address that would require more time than I have at my disposal. Suffice to say that the advance in sanitary matters has been, indeed, remarkable, both in the enforcement and observance of the required rules and regulations as well as the popular education of the people. Through your active and efficient co-operation we have been enabled to lay the foundation for a sanitary structure which will endure for all time to come. In the accomplishment of this work the local boards and their executive officers are entitled to great honor and credit. You have battled against all the forms of opposition which are the outgrowth of ignorance, and you have often suffered the most ignominious persecutions as a reward for trying to teach the people how to prolong life and preserve good health. In this connection I would be withholding justice did I not pronounce a fitting eulogium upon the one who has been most prominent in the work. The man who has been with the board from the days of its infancy and has conceived many and executed all of its movements. The man who has braved the contagion of the most malignant and infectious diseases and has never shirked his duty. The man whose name is a household word in every town, village, hamlet and community of the State. I refer to our noble Secretary, Dr. C. O. Probst.

Gentlemen, I hope your deliberations will be pleasant and profitable, and that you will make the meeting as interesting as possible by entering freely into the discussion of the various topics which will be presented.

After some announcements were made by Dr. Probst, the president introduced Mr. Thomas B. Webb, Deputy Health Officer, of Warren, Ohio, who read a paper upon the subject of "Inspection of Dairies and Milk Supplies."

INSPECTION OF DAIRIES AND MILK SUPPLIES.

By THOMAS B. WEBB, Deputy Health Officer, Warren.

MR. PRESIDENT, MEMBERS OF THE STATE BOARD OF HEALTH, AND GENTLEMEN OF THE CONVENTION: Dr. Probst, your worthy Secretary of the State Board of Health, has seen fit to call upon me to give you a brief account of my practical experience regarding the inspection of cows and dairies in the city of Warren. I will state that about eight years ago the board of health of our city was reorganized for "business." Back of it stood a city council, as has since been, and now is, liberal, and broad in its dealings with the board, ever giving it sufficient financial aid and legislative encouragement. The board, proud of its trust, though guardful of its funds, has always endeavored to advance good sanitation and pure food. Among other progressions that contrast it with the "old order of things," is especially its work to procure for the city a supply of pure and wholesome milk. To bring this about it was necessary to adopt certain local laws, which we have in Standing Orders 66, 67, 68, 69, 70, 71 and 72 of our sanitary code, which are as follows:

No. 66. No person shall sell milk within the city, from a stand or wagon, until he has exhibited to the inspector of food, appointed by the board of health, his cows and stables, and the cows and stables of all persons of whom he obtains milk, and receive from said board, and posted up conspicuously in his stand or wagon, a certificate of inspection, showing that such person has complied with the requirements of the standing orders of the board of health, and is authorized to furnish milk to the citizens of Warren.

No. 67. All persons wishing to sell milk from stand or wagon, shall make application for inspection during the months of March and September, of each year, if then selling milk, but if not, then as soon as he decides to do so. He shall, with every application for inspection, pay to the inspector the sum of fifty cents for the benefit of the sanitary fund. And every certificate granted shall expire on May 1st or November 1st, next following the granting and issue thereof.

No. 68. Every person making application for inspection as vender of milk shall therein make known to the inspector the number of cows owned by him, if any, the name of the owner and the number of cows of all persons from whom he gets milk, and such other information as the board of health may require, and he shall not receive, sell, or offer for sale, the milk of any cow not inspected under his last regular or a subsequent application, nor of any cow condemned at such inspection, until such condemnation is removed on subsequent inspection by writing, signed by such inspector.

No. 69. No person shall sell milk in the city who has upon his premises, or in his possession, or who gets milk from any person having on his premises, or in his possession, a cow giving milk, which has been condemned by the board of health as unfit to be kept by such person, until such condemned cow has been put off the premises and out of the possession of such person.

No. 70. No dealer in milk, and no servant or agent of such a dealer, shall sell, exchange, or deliver, or have in his custody or possession with intent to sell, exchange or deliver, milk from which the cream or part thereof has been removed, unless in a conspicuous place, above the center, upon the outside of every vessel, can or package, from which or in which such milk is sold, the words "skimmed milk" are distinctly marked in uncondensed Gothic letters not less than one inch in length. (Revised Statutes, sec. 7,458–14)

No. 71. No person shall sell, offer, or have for sale in the city, any unwholesome, impure, diluted or adulterated milk, or milk known as "swill milk," or milk from cows that, for the most part, are kept tied up in stalls, or that are fed on swill, garbage, still slops, or other like feed, nor any butter or cheese made from such milk.

No. 72. All persons are amenable to order No. 69, and all persons are amenable to the foregoing orders who furnish milk to retailers, and all persons within or without the city who milk more than one cow and retail milk.

It will be seen that not anyone having more than one cow can sell milk in the city without having first obtained a certificate of inspection from the board or its proper officer. This certificate is the key to the situation. It being necessary to make application and have inspection in advance of issue. In order to obtain this certificate the application is made to the inspector of food, an appointee of the board, made under provision of section 2,133 of the Revised Statutes of Ohio, empowering boards of health to make such appointments. This authority can be vested in the health officer or other person, but our board has seen fit to add those powers and duties to its sanitary policeman, he being a full-salaried officer, and the duties being in the line of his work; and further, because he being a practical man in close touch with the board, has the proper effect to keep this work under the immediate supervision of the board.

Inspection of our dairies is always twice, sometimes three times annually, with usually one or more members of the board. This inspection pertains to an examination of the cows, their health, grade, and condition, the water and food supply, the barns and ventilation, drainage, warmth and cleanliness thereof, after which a report is made to the board at its first next regular meeting, of the finding of the inspection, together with suggestions and recommendations for the betterment of existing conditions. If all reports are satisfactory, the board thereupon issues its certificates of inspection for the ensuing six months. This certificate contains a clause "That it may be revoked for cause not now apparent," and a fee of fifty cents is charged for this certificate, and they are required to be posted conspicuously in the stand and wagon of all milk venders. We are pleased to say that the board has met with little opposition in this work, and that little being at the inception of this movement, for "pure milk," made mostly by dairymen who could not hold their own when practical tests were applied, and whose names are now lapsing in the memory of forgotten ones.

An important feature of our work on this line is the testing of milk offered for sale by the various milk venders. Some years since the board had heard well grounded complaints that some of our venders were peddling milk of poor quality, and I presume many of you gentlemen have heard similar complaints in your own locality. Our board sought to aright this matter, and improve the quality of the milk by stimulating the dairymen to the improvement of the dairy and its surroundings, by an honest and intelligent competition in the quality of the milk produced. Tests were made monthly, on days unknown to the dairymen, of milk obtained from the wagon or source of public supply. Results of tests were carefully made and reported to the board, which, with its proceedings, were rapidly turned into print by the ever untiring press reporter, thereby informing the public fully and intelligently of the quality of its milk supply.

Public judgment, intelligent, being based on facts, gave an impetus to each dairyman to have his products' result, at least, equal with, if not superior, to his competitor.

The lactoscope or dilution tester and lactometer was the first system used by us, but they being liable to error and not scientifically accurate, were replaced by a "Babcock tester," which has proved quite satisfactory and possibly as good as any sort of a chemical analysis. We find that our system has had the effect of a general improvement in our dairies and the milk supply. Barns have been improved by being made warmer, with good ventilation, grout floors being provided so as to prevent the cows from underground filth and contamination. Stalls so arranged as to keep the cattle as free from the manure as possible. Water supply for the cows has been also greatly improved by being obtained from deep drilled wells that are free from impurities. The better supply of food and care for the cows has been followed by the general improvement of the health and strength of the cows, and consequently a material increase of milk of a purer and more wholesome quality.

As a result of our experience and observation we would recommend:

First. That all boards of health establish a regular system of dairy inspection and tests of milk.

Second. That they should insist on larger, warm, and well ventilated barns, having some kind of water tight floors in stables that will permit of being easily cleaned, and prevent filthy accumulation under barns, and that barns should be kept clean and well drained, and the cattle should be guarded from every contamination at all times.

Third. That sufficient and wholesome food and a regular supply of pure water should always be provided.

Fourth. That in winter season when cows are stabled they should have sufficient daily out-door exercise.

Fifth. That some improved methods of tying cows in stables should be provided in order to keep them as free from manure as possible.

Sixth. That all milk be aerated and cooled as soon as milked.

Seventh. That a monthly test of milk be made by the board and its results published.

The introduction of such a system might be objected to by the dairymen as expensive, yet we can assure them that upon trial they will find it of material value to them in the increase of their ultimate profits in business, as well as giving a greater satisfaction to the community at large, by furnishing it with a wholesome milk supply.

For eight years we have striven to promote the health of our city by the bettering and purifying of its milk supply.

This system has developed, and experience has pronounced it good. It is susceptible, doubtless, of improvements, and we invite suggestions or criticisms.

President: This is a very interesting paper, gentlemen, and is now before you for discussion.

Prof. Nelson: I hope this subject will not be passed without discussion. It seems to me that there is no question of greater importance to come before us than the one just presented and I hope that all who have practical experience on this subject of milk inspection and regulation of milk supplies of the cities, will take part in the discussion and give us the benefit of their experience. There is no article, I think in our whole food supply that is so often adulterated as milk, and I believe that only by persistent effort of the health officers will this contamination or adulteration be prevented. It is so profitable that the persons who are engaged in this business can not resist the temptation to adulterate their milk. Within a few days I have read a report of milk inspection in New York City, and the health officer there said that it was so profitable that persons persisted in watering and skimming their milk, although they had been repeatedly arrested for it, and within a few days they were found continuing to water and skim their milk because of the profit in the business. I believe that it is important that we should have inspectors to inspect the milk and the source from which the milk comes, the cows, the manner in which they are fed and kept; that only by this persistent effort by the health authorities will this fraud be prevented.

Benjamin Bennett, Geneva: I would like to inquire of the gentleman who spoke of the inspection of milk in the city of Warren, when the highest standard and best quality of milk was furnished, in what

manner that was brought before the public, whether it was kept as a record in the health office, or how it was made public as to who furnished the best quality of milk?

Mr. Webb: Of course a record of it is kept in the health office.

I. A. Oldham, Cambridge: I would like to ask the gentleman, in testing milk, what instrument he used.

Mr. Webb. We used the Babcock tester.

A Member: I enjoyed the reading of that paper very much, and there are many good points in it, and though there would be great difficulty in following them out in many places, nevertheless it should be done. I would only add one suggestion, and that is that it should be impressed upon all dairymen the importance of docility, quiet handling of their animals. We all know that any animal irritated, cross and ugly, will make unhealthy secretions. This should be impressed strongly upon dairymen.

Dr. W. N. Unkefer, Piqua: We have a state officer, who yesterday got samples of milk from our inspector of milk, one we just lately appointed. He came over yesterday, and the result is yet to be determined. I think, gentlemen, we cannot be too particular in the case of milk inspection, because in the milk supply there is a great deal of food. In Piqua we have twenty seven or thirty wagons that furnish milk, and three or four milk depots. There is an immense amount of milk used and the people get very careless, and he found that some of the places kept very unhealthy milk, and we told him to get after them rapidly, and it was under his instruction that this officer came over. I hope that the State Board of Health will see about this, because it is one of the most important things we have to deal with. It is in every day use. I think we use more milk than we used to, and we ought to be very careful in handling it; that we get only fresh milk, and the only way to do this is, as the essayist says, to thoroughly inspect it, which we have been doing. We have gone around about twice a year, which I think is not often enough.

Mr. Shaeffer: I would like to ask the gentleman from Warren who read the paper, whether the tests that were made disclosed anything more than the presence of water? Did it detect uncleanliness?

Mr. Webb: We just tested for the water.

Mr. Shaeffer: Then any dirt that may have been in the milk was not tested for?

Mr. Webb: No, sir.

J. O. Hess, Health Officer, Fostoria: I have been testing milk in Fostoria about four years. We adopted and have been using the lactometer, but before we began testing milk we had a very poor quality of

milk, but since we commenced testing it we have been getting a fine article of milk. In fact, I think there is no one in our city who is getting poor milk now. We inspect the dairies. About three or four years ago a state officer came around, and he said he wanted to catch some of our milkmen. He was very anxious about it, and he went to a milkman and he said he would like to get a quart of milk. The milkman let him have it, and he brought it down to my office and put it in my care, and went out and got some more. When he got it all together he sealed it up nicely and sent it to Toledo for analysis, and when it came back they said it was as fine milk as they ever analyzed. I think milk inspection is a fine thing. I inspect every morning when I am there. If we get milk that will test 110 we are getting fine milk. If we get it to test 120 or as high as 125 there is a good deal of water in that milk. You can take a pint of milk, put it in a glass jar, and it will test 115, and if you put in a teaspoonful of water, it will go up to 120. We have tried it and we know what we are talking about.

Dr. Stanton, Cincinnati: I would like to say that the lactometer is one of the poorest tests that we have for milk adulteration. It is true that skimmed milk will have an increased specific gravity, and by putting the lactometer into a sample of milk you can tell whether it has been skimmed or not, provided no water has been added. The removal of a small portion of the cream will increase the specific gravity, but this can be counteracted by the addition of a similar amount of water, and the dairymen know that where they skim the milk they have to add water to bring it up to a normal specific gravity. Skimming milk alone is not very often practiced, but skimming and watering together is frequently practiced, and the lactometer will not show whether milk has been skimmed or not, except when used by an expert. If you insert a glass rod into milk that is pure, milk that has not been sophisticated, there is a film of milk or cream that will adhere to it that can be seen. If you skim a small amount of cream from that milk and then add water to restore the specific gravity, the lactometer introduced into the milk will not show that film, the cream will not show when it is withdrawn. An expert can judge of this, not by the specific gravity of the milk, but by the adherence of cream to the lactometer after it has been withdrawn. So the lactometer is not to be relied upon as determining when milk has been watered or skimmed. It can not be depended upon in any case that is to be brought before a court. In that case a chemical analysis is necessary. Skimmed milk often has a blue appearance. Milk that has been tampered with is frequently colored, and on withdrawing the instrument from the milk it does not present the appearance that it should present. There is no film of cream adhering to it. The lactometer is

perfectly worthless in testing milk except by a person who is accustomed to its use. Wherever the lactometer is used alone it is no use whatever, except, perhaps, it may frighten a dairyman for the time being into a little better compliance with the laws, until he learns how to meet the requirements of the officers.

A Member: Then, how would you make the test?

Answer: By chemical analysis.

Dr. J. Bridinger, Tiffin: About five years ago we commenced an investigation and inspection at Tiffin, and at that time we found a very poor quality of milk, adulterated, and watered, and skimmed. We had quite a time with the dairymen after we began testing the milk. We found milk that when analyzed did not come up to the standard prescribed by the law, and had the milkmen arrested. We produced enough evidence to convict the men before any jury, but we failed to convict on account of the severity of the law; nevertheless, we produced evidence that could not be contradicted. We hardly knew what to do, but we started out a little over a year ago with a new procedure. We license the milk dealers now. We li ense everyone free of charge, and this license is revocable for cause. If we find anyone selling mi k that does not come up to the standard we revoke his license.

The lactometer is unreliable unless you get a reliable instrument. I have had, in the last two years, four or five instruments that are not reliable, that is I mean lactometers. And within the last six weeks or two months I secured one in Chicago that is reliable. We have other instruments. We have the lactoscope, the cream test and the water test, and whenever we find anything by these tests of the milk that indicates that it is not pure, or that there is anything wrong with it, we analyze the milk. We find that that is the only true way to get at it, and then we discover whether there is anything in the milk—water, dirt, or anything else that should not be there; and we have brought our dairymen down to a basis where they sell us about as good milk as is furnished to a city anywhere. We not only examine the milk, but the wagons and the dairies. We ascertain what is being fed the cows, and we see that the stables are kept clean. About three years ago I went all around and examined all the stables, and I gave notice that unless they cleaned their stables they could not sell their milk any longer. So they have nice clean stables for their cattle, and also good water. I think we cannot be too careful in this examination of milk.

Now, then, what I desire to ask is this: In case of an analysis which, according to the state law, is necessary for a conviction, we fail to convict when we produce sufficient evidence that cannot be contradicted, what is the remedy? It occurs to me, Mr. President, that there should be an

amendment made to that law so that it would not be quite so severe. It has also occurred to me that that law was made principally for the larger cities before the State Board or local boards were organized in this state. Now, in small places there are some dealers who are rather poor, and the sympathy exists with the jury, and it has been true at Tiffin that they allow the dairymen to go because they thought it was a hardship upon them. I told some of them that I did not think it was a hardship; that the law was to eradicate the rich or poor who could not furnish a good quality of milk. We look after it twice a month, and if we find anything wrong one morning we look after it the next morning. We stop the milkmen in any part of the city. The first thing they know they are hailed to stop, and they stop. Some of them tried not to stop, but we went after them and they paid for it, and since that they stop when they are called to stop. As I said before, I would like to know what is the best remedy in case the analysis shows the milk to be below the standard required by the state, and you cannot convict before a jury or justice of the peace?

Dr. O. E. Phillips, Fremont: It seems to me that this discussion we are having here is important. The thing that it seems to me this board of health is trying to get at is the healthiness of milk, or in other words, what means have we of getting at the healthiness of milk. Now, we have been talking about our tests, but may it not be true that we may have a specimen of milk, the specific gravity of which will be a great deal higher than will be required and still be very unhealthy? Because there is organic matter that gets into it in some shape whereby we get hold of the germs of disease. Now, if your tests amount only to getting at the specific gravity, haven't we got water that is more healthy than that kind of milk? These health officers are not all chemists, and if they were they have not the time to go to work and analyze and test all these specimens of milk and get at the organic matter that is in it. Now, what I would like to know is, if there are any means whereby we can arrive at the amount of organic matter that may be deleterious in these samples of milk? Water we can look out for, and water don't kill people as much as some forms of organisms that may be in the milk.

Dr. J. C. Nichols, Marion: I do not think that this matter of polluting milk with water is of so great importance, or that the fact that the lactometer is practically worthless, but what we want to know in the testing of milk is, whether the germs of disease are in it, and perhaps we can do it better with the microscope than by any other means. We want to eradicate the disease germs; keep your stables clean and feed good feed. In my town this subject has been agitated considerably. There are two

dairymen there who have been feeding malt from the brewery, and one man used buffalo glutton a great deal to feed his cows, and we examined his milk very carefully, and found that with this glutton preparation the milk sours very rapidly, and the cream does not rise as rapidly as it should. As regards cleanliness, it is practically clean. We are feeding it to an infant, and I find the only way to get rid of these germs, for there are germs in most milk, is the Pasteurizing or sterilizing of it. There is some difference between Pasteurizing and sterilizing milk.

Dr. Stanton: Did I understand you to say that adding water does not depreciate the value of milk?

Dr. Nichols: No, sir, it does not add to the value of the milk.

Dr. Stanton: I gathered that from your expression. I am glad that I got a wrong impression, for I should hate most terribly to have the impression go out from this meeting that water added to milk does not injure or depreciate its value.

Dr. H. E. Welch, Youngstown: What are you going to do in case you arrest a man for selling adulterated milk, prove the milk is lower than the standard and yet not be able to prove that he put water into his milk? The law requires that you must prove that he adulterated the milk. The gentleman over here says that it depreciates the milk, but I do not think it will; it doesn't add anything unhealthy to it. Water is very healthy no matter where you find it. It is the inspection of the dairies and the milk cans that is of more importance than the testing of the specific gravity of the milk.

Dr. Thomas C. Hoover, Columbus: I admit, as Dr. Welch states, that the addition of water to milk does not render it unwholesome, but I will submit that perhaps a person's stomach would scarcely be large enough to hold a sufficient quantity to get a little milk. [Laughter.] It certainly does not improve the milk as a nutriment. It may not make a person sick, but it does not add to the nutritive value of the milk. By its long continued use, as is frequently noticed by physicians, these little youngsters become "aldermanic" about their abdominal portion. They swell out to make room for the water, with the little milk that is in it. [Laughter.] The question of milk inspection, as I understand the paper, with which I was very much pleased and it seems to me covers the ground; and as we have reasons to know that Warren does things pretty thoroughly when she starts in on sanitary matters, the inspection at Warren is not confined to milk analysis, milk examination; but it includes, as I understand it, the examination of the dairy stock, the cows, their quarters, their feed and so on. Given, a healthy cow, properly stabled, properly fed with a good quality of food, and we would reasonably expect to get a good quality of milk. Then if that milk contained the proper

proportion of fat, that is still further and stronger *prima facie* evidence that it is good milk. We cannot determine whether it contains disease germs or not except by bacteriological examination, but that is a step further on. A bacteriological examination will hardly be rendered necessary if all of the other conditions are supplied. A good cow, properly stabled, fed with proper food, the milk properly taken care of in a clean manner and neither skimmed nor watered, the strong probability is that you would have a good, wholesome supply of milk. So far as the sterilizing or Pasteurizing of milk is concerned, investigations in that direction that have recently been made, show that there is some change taking place which deprives it of its nutritious material, that it is not readily digested. All of the experience in this direction goes to show that raw milk, if it is pure, is the best form in which to administer it.

Now, so far as the lactometer and the Babcock method of testing milk are concerned, I am not posted and do not profess to know anything about them. I have listened with some interest to Dr. Stanton and I believe that it is only necessary to test bacteriologically when there is reason to believe that the milk is derived from unhealthy animals, or is improperly cared for or received in dirty vessels. If the inspection of milk covered everything that it should it would include every detail from the purchase of the cow down to the distribution of the milk to the consumer.

Dr. Young: Milk that is derived from cows that live in a barn is not wholesome milk. The milk left open for half an hour in such a condition absorbs all the odors of the place very rapidly.

Dr. A. W. Hopkins, Health Officer, Ashtabula: I was very much pleased with the paper. It gave us a statement of how the work was done at Warren. It gave us a good many ideas of what that inspection should consist of, but what I would like to get at is this: I agree with the author of the paper, and others who have spoken, that we should watch the health and cleanliness of our dairy and the handling of it, but how can we get after that tricky man that will water his milk and skim it? Now, a man ame) o our town, and he said, "Here, I have got something here that you can use with your milk, and I defy any test that I know of." He says, "I will guarantee it and stand back of you in all suits. I will pay all your fines if you will use it. Pay me so much and use it and follow my directions. If it can be detected, if somebody don't catch you in the act of doing it, I will stand behind you. By using it no one can tell that water has been added." Now, if that is so, and we say that our lactometer is no good, and that is something that we pinned our faith to in days gone by, is there a test that will absolutely show it? I have failed to find any such test. But if our friend over here, Dr. Stanton, or any one else

has any test that is absolutely certain, that is what we want in Ashtabula, and a good many others want the same accurate test that we can stand upon and swear by. It seems to me there ought to be no difficulty in testing milk. It is just as easy to tell what it consists of as it is to tell what a solution of bi-carbonate of soda consists of. And no prosecution should be begun except where a chemical analysis has been made. Now, a word upon the addition of water to milk. It seems to me that not enough has been said against this. I hope that the impression will not get out that it is a matter of little moment the addition of water to milk. It is important to the sick child or the infant, that it should have all there is in the milk, and the addition of the purest spring water is a crime that ought to be punished. A man who would do it would steal. It is just as much of a crime to add water to milk as to take the cream from it, simply because you deprive the person of just so much nourishment, and the child that depends upon the milk has not what it ought to have. Again, the addition of water is likely to lead to disease, because so much of the water that is used by dairies is not pure. It is not at all infrequent to find micro-organisms in milk that can be traced to the water with which the milk was adulterated, and disease germs have very often been added to the milk in this way, by taking water from contaminated wells. This has been shown in repeated bacteriological examinations that have been made in the cities. New York City, for instance, within the last two or three months has been making much more frequent bacteriological examinations to determine what can be found, and they have found almost all disease germs in milk that can be carried by water.

Dr. Probst: I would like to ask whether Dr. Fulton will be called upon to read his paper before this meeting adjourns. I had some remarks that I wanted to make on milk distributed diseases, but it would be more proper that they be made after the reading of that paper. I do not know what the intention of the meeting may be, whether it is expected to omit it from the program entirely, or whether we will take it up for discussion.

A Member: I wish to make a suggestion. I believe that all here are invited to attend this meeting for the purpose of getting some instruction and benefit from the remarks made. It seems to me that there is a little coterie of gentlemen over in that corner of the house talking to each other. They rise and face the chairman. They do not face us, and nobody in the rear part of the house can hear a thing. Now, if you are going to talk to this body, talk to it. [Great applause.]

Mr. Florien Giauque, Glendale: Two of the gentlemen have asked what we are going to do with men who adulterate milk. I take a great interest in health matters, and am a member of our board, but I am a

lawyer. I do not defend crimes, but I prosecute them. The trouble is not so much with the lawyer in the prosecution as that you get a dozen fools in the jury box. [Laughter.] I don't know how many of you have been in a jury box, but you will let some lawyer talk you into believing that black is white and you will forget you have any common sense. Now, as to practical remedies for the adulteration of milk. We will go home, and tomorrow and next day we will have milk and we cannot analyze that milk, but if we are afraid of it we can tell our cook to boil it. It is not quite as good as unboiled milk, but it is better than milk containing disease germs. Now, going back to what to do to prevent this adulteration when you cannot convict. Follow the plan that is followed in some places; that is, issue a license to the milk seller, and if he is found guilty of adulterating the milk, put it in the power of the board or municipal body to revoke his license, and then he must pitch into you. You are on the defensive then. If you revoke his license, for a man who is guilty, knows he is guilty, he will submit to that kind of a thing. If he knows he did adulterate that milk he is less likely to commence a suit. Then there is another way aside from these two, and that is to watch the places where the cows are kept, see the cows themselves, see what they are fed and see that the cattle are healthy and have healthy surroundings. See if the wells are clean, and if the water is put into the milk, see that it is pure, good water. I do not think that anybody holds that it is a good idea to adulterate milk with water. Then there is another point that might be made. In villages of a thousand inhabitants and less, and other towns where there is no chemist, it is practically impossible to get one. There may be some plan which we might agitate for raising some fund for the employment of a chemist, whose duty it would be to go about from place to place and analyze milk and other products. We have a State School Commissioner, and that is proper. Perphaps there ought to be an analytic chemist, and if there is such an officer he ought to be capable.

A Member: The State of Ohio has just such an officer in the Food Commissioner.

Mr. Giauque: Yes, but he don't get around.

A Member: I would like to ask the attorney who has just spoken, Mr. Giauque, if a city or village council has a right to pass an ordinance requiring milkmen to take out licenses for the purpose of selling milk?

Mr. Giauque: I do not pretend to have good enough memory upon the laws of the State of Ohio to satisfactorily answer your question, but my impression is that the council has that right.

Dr. Welch: I think it is a fact that no license can be exacted from a man who sells the products of his own land. If a farmer comes to town

and sells milk, a production of his own farm, he cannot be required to take out a license.

F. M. Wood, Dent: I was at one time supplying milk in Cincinnati as a dairyman and I was compelled to take out a license, but was not charged anything for it. There has been some discussion here as to how to keep the cows. They should be turned out in the air each day. At our place during the winter the cows were kept in the stable, but the stable was kept clean and the cows were curried every day and their food was all cooked by steam, and our cans were first rinsed in cold water and then washed and afterwards scalded out with steam. Of course I never used water with my milk. I have good water and I have been sorry ever since that I did not use my own water. [Laughter.] I am out of the business now.

I admit that the care of the cattle is a great thing in the care of the milk. One gentleman here wanted to be insured against buying skimmed milk. I would say that the best plan is to buy of some other dairyman, because he will have to skim if he gives you cream. He cannot help himself.

There is one question I want to ask. We used to have "cream" customers that would ask for one cow's milk for children. We used to deliver it in pint cans, as much as they wanted each day. Sometimes the cow that gave the poorest quality of milk gave the best cream. Now, why was it that we used to have the best results from the cow that gave the thinnest and poorest milk? We have quite a number of cows that raise two or three times as much cream as others, but for what we call the "baby milk" we always furnished it from the cow that gave the poorest milk.

D. C. Parker, Upper Sandusky: The question has been asked, What are we going to do with the man that sells diseased milk? My understanding of the statute is, that the board of health has jurisdiction over that subject. Now, I am a member of the board of health of Upper Sandusky. Unfortunately for my clients, I try a law suit occasionally, but being a member of the board of health I consider myself a part of it and keep out of their lawsuits. My idea is not to go to the man that sells diseased milk and say "We are going to have you arrested and take you before a jury of twelve men and try you," but the first thing we are going to do is to inform that man that in our opinion he has committed a nuisance. Now, what is the remedy? The remedy is for that man to come before the board of health, and not before the jury, to purge himself of his conduct. If he is innocent there is the best place in the world to establish it, and if he is guilty the board of health then has a remedy to prevent the committing of a nuisance. And it seems to me that in the

place of rushing off to the criminal courts to take care of a man that has committed a nuisance, we should settle his case right in the board of health, and the board of health as I understand it, is a board whose powers are almost boundless. We have not had a case of any kind, of any nature, of any nuisance committed in the village of Upper Sandusky, but what the board of health has quietly and peaceably gone at that nuisance and absolutely squelched it, and we have had no trouble. These trials are the things we want to avoid, as in nine cases out of ten the proof is not ample to convict a man of a crime or a misdemeanor. But the power that the statutes give the boards of health in this State, in cities, municipalities and townships, are ample to suppress any nuisance that comes before that board.

Dr. Thomas G. Farr, South Charleston: I would like to know if the gentleman considers the sale of water in milk or of skimmed milk a nuisance?

Dr. J. Bridinger, Tiffin: I do not know as far as I am concerned whether we would constitute it a nuisance or not, for a dairyman to sell milk that did not come up to the standard, but the general method is all right. We have to a certain extent adopted that measure in Tiffin. Since we have been licensing dairymen when we find that they are not furnishing a good quality of milk, or that they adulterate their milk by adding water to it, we cite them to appear before the board of health to purge themselves of that of which we have found they are guilty, and if they can prove themselves not guilty, well and good, and if not, we propose to revoke their license and not let them do business any longer.

And now another matter that came up here in regard to the cow that gave a poor quality of milk gave apparently the best satisfaction. I have analyzed such milk and have no doubt it is true that it is not always the cow that gives the most cream that has the best milk.

D. C. Parker, Upper Sandusky: The gentleman over here asks me what we are going to do with the milkman who puts water in his milk. I thought I had explained that. The board of health has not the power of the Czar, but they come mighty close to it. The board of health has the power to determine what is a nuisance, and when they have determined what is a nuisance they then have determined the gist of the action. If the board of health says, John Jones has placed water in his milk and is selling it to the public, we say, John Jones has committed a nuisance. I think that settles it; that is enough. I say the board of health has absolute power to determine that question. That is the foundation of the whole action, what is a nuisance? When you have determined that, you have absolutely determined the entire question.

A Member: I want to ask one of the legal gentlemen a question that

concerns me. In our town, and it is not like many of the larger places with a population of several thousand, we have farmers who bring in milk from the country creameries and distribute it to the citizens of the place. What rule of action have we there? As a member of the board of health I have not found any way by which I can stop these gentlemen on the road, and we have no opportunity of knowing the character of the cattle. I want to know what would be the rule of action in such a case?

A Member: There have been quite a number of persons on the floor who have produced arguments concerning the question which mostly refers to milk. Now, I would say to this respectable assemblage that have gathered here to-day that the second gentleman that has been on the floor, I think, has almost given you the inside track to the whole thing. In the first place we want to know whether we have got laws sufficient to carry out this matter pertaining to the board of health. If so, in the second place we want to know whether we have got intelligent men filling these offices and to look after them and see that they are doing their duty. If so, that ought to settle that question. Now, a gentleman gets up here and says it ought to be license. I would ask the question here, whether you or I or anyone else in this house cannot look after our own business whether it is licensed or not licensed? I would say to you that you add an expense to that milk, to the poor man who buys that milk, for he has got to pay it. And I say no, we have got enough expenses. And the next gentleman gets up and wants to know whether watering it is a nuisance. I want to ask you whether there is anyone here who can say that anything that is impure is not a nuisance? If so, then the question arises right here; if the board of health has the right to determine what is a nuisance and how milk ought to be sold and how it ought not, it is mine and your business to watch the man who is going to rob the people, and when we think he is putting his cattle where he ought not to—in some low bottom where the milk would become adulterated, it is our business to look after that, and if he waters his milk it is our place to get some inspector to inspect that milk and after he inspects the milk and passes upon it, that ought to settle the whole question.

Member from Massillon: Up in Massillon, Stark county, we have one dozen dairymen. They are just about as honest as common people, and we are getting first-class milk, and I do not believe we can accomplish everything by law or by the enforcement of law. I wish to say I came here in the interest of a firm who has testers for sale, and it is not the Babcock, either. Now, a great many of us know what ought to be done. A city gentleman ought to go out to the farm and investigate the barn of the farmer. I heard of such a man going out to inspect the barn of a farmer and the cattle and their surroundings, and he didn't know the differ-

ence between a Jersey cow and a Durham bull. [Great laughter.] Now, we have talked about tests and remedies. The tester I will mention—it is a firm known all over the State of Ohio—you give a woman a quart of milk and the next day she will tell you all about it. We have excellent water at Massillon, and, of course, we do not want to buy any of the milkman; we have to pay enough to the water works people. As to the remedy, quit the milkman. Buy your milk of the man that brings you good milk.

Mr. Miller, of Akron, Ohio: I know this question of licensing milkmen has been discussed here and a number of questions asked, and I do not know that I can do any better than merely to give a little history of how we are doing in Akron under our license system, which we commenced in 1879. It does not raise the price of milk by imposing a license, for there is no charge for the license, but they must get their license or pay the penalty if they undertake to peddle milk without it. Since we adopted that system it became necessary in a few instances to raise the amount and fine them for misdemeanors, as we style their offenses, which is also the result of an ordinance enacted by the board, the city council fixing a money penalty. There may be imprisonment connected with the penalty, and we have our health officer and sanitary policeman, who is out early in the morning, to catch the milkmen. Perhaps every month he tests each man's milk with the lactometer, and if the milk is not right he notifies him to report to the health officer, or the board of health, as the case may be, and then if the quality of his milk meets the test, he is allowed to go about his business; and we have had but very little trouble. There have been very few arrests made in the last six or eight years.

Dr. W. A. Daugherty, Health Officer, Bucyrus: About one-third of the milk sold in Bucyrus is sold by private parties, and we require everyone selling a pint of milk to register with the health officer, and he has the names of all supplying milk in the city. This is done instead of issuing a license. I might say for the benefit of those who are not living near a chemist who would like to have examinations made, that you can make arrangements with Professor H. A. Weber, of the Ohio State University, who has quite a number of students all the time making tests of milk, and I think they would make any examination at any time if you would pay the expressage upon the milk to the university. I think, perhaps, that would be satisfactory where you are not near a chemist.

Dr. Charles E. Blacker, South Bloomfield: The question that the dairyman raised about the poorest cow giving the best milk has been pretty well answered. I wish to state that experience proves just what he has intimated and what the other gentleman has said. It is true that

children do better on milk that is not so rich in cream, and that is because the stomach is not able to digest such a heavy rich article.

F. M. Wood, Dent: I suspicioned all the time that the people were complaining about having such a poor quality of skimmed milk, and I thought if it was better for children it was better for big people, too. [Laughter.]

Dr. James F. Fitzimmons, Bucyrus: One question concerning food has not been spoken of to any extent and that is the food for children. If you dilute milk with a quantity of water you necessarily dilute the casine in the milk, and hence it becomes more digestible. The casine must be brought to represent the quality of the mother's milk and that is done by the addition of sterilized water and a little sugar of milk, and when that is done in the proper proportion we have the constituents that represent the mother's milk. The nearer we can get to that point the nearer we have the ideal food. Hence, the foods that are manufactured and sold to the community are based upon the idea, either right or wrong, that they have adopted a food that is suitable to the child. Right in this connection, when we have diphtheria and scarlet fever and whooping cough and measles and all the contagious diseases prevailing, in some parts of the State, it is sometimes very difficult to get good water. You can only get perfectly pure water by sterilizing it. The water taken from the ground is not absolutely pure. It contains both organic and inorganic matter. Hence, if water is supplied to the milk our milk is adulterated and is not pure food. Children have a right to have pure milk. Primarily they have a right because they have no choice in the matter. Adults are not compelled to use milk, but children are. I am satisfied that milk rich in cream is not fit for children. We can only get a good quality of milk by having it examined by a man competent to do it, and somewhere there should be authority to direct at the expense of the State, county or township, that the child be furnished with pure food. We have that right as citizens to supply our children with pure food, and compel our citizens who sell milk, either by license or by registration, to furnish a pure article of milk, and I believe that we have a right to put them under bond to furnish it.

President Wise: Gentlemen, your discussion has been very interesting, but the time for the discussion has expired, and we will now hear from the author of the paper if he desires to say anything more.

A Delegate: I would like to ask one more question, and that is in reference to the boards of health notifying an offender to appear before them and he refuses to do so. What in that case is our remedy?

George Flammer, Covington: I think I can answer that question myself, if I understand it. When a nuisance is complained of to me, my

remedy is to examine it, and if I find it to be a nuisance, I give the man notice to abate it in a certain length of time, and as a general thing I find that the offender will go himself and make his defense and before he gets through he will give up, and if he don't do it, I have through the board the authority to go and abate it myself.

M. S. Gish, Sterling: I come from a cheese and butter district, and I would like to know if the bacteriological part of this discussion enters into that part of the product, butter and cheese?

Mr. Giauque, Glendale: I do not want to take up too much time, but we now are discussing a question that has been a perplexing one to the board of health of Brooklyn township. We are situated as you know, right at the suburb of a great city, and we are subjected to all the classes of nuisances which are crowded out of large cities, and consequently this question of litigation that arises from the attempt to abate a nuisance, is a question that it seems to me we need a little litigation upon. Now, the questions that were asked here have been fairly answered, perhaps as fairly answered as the statute provides, but our courts seem to find a great deal of difficulty in getting at a law by which these offenses can be punished, and by which they have jurisdiction to punish them. Now, if upon investigation we find such provisions as will reach this question, it seems to me, it would be wise to appoint a committee at this meeting to provide some measure by which we can abate those nuisances that are committed by people who are law-abiding citizens.

Mr. Flammer, Covington: Probably I can help the gentlemen out in the way of litigation in the matter of vault cleaning. We cleaned several vaults last year. Two of our most prominent citizens refused to have their vaults cleaned. One was within twenty-one feet of a well, and a great deal of the contents of that vault drained into the well. Well, he said, "I will attend to that this fall." I told him I would give him twelve days. The twelve days came around, and I notified the board that he had not cleaned the vault. I gave him three days of grace and he did not do it, so I hired a vault cleaner to do the work for him and we put it on the tax duplicate and made him pay for it with his taxes. I don't know whether we went according to law or not.

A Member: I have been listening with much interest to these modes of abating a nuisance. With us, when a nuisance is complained of, the health officer inspects the place, and if he considers it a nuisance the offender is notified in writing to abate within a reasonable time. At the end of that time, if it is not abated, the board of health goes there in a body and views the place. If they consider it a nuisance they so declare it and condemn it, and the officer is directed to abate the nuisance and

report to the auditor, who places it upon the tax duplicate, and we have never had any trouble.

President Wise: Gentlemen, it is probable that we shall have another paper on this subject to-morrow, and that will give you ample opportunity to debate the question. We will now hear from Professor Nelson.

THE GERMS OF HEALTH.

Professor Edward T. Nelson, M. D., Ph. D., Member of the State Board of Health.

It was Tyndall, perhaps, who first clearly demonstrated the presence of living matter in the air. He insisted from the first that this matter is not general but particulate; that it consisted of species of animals and plants; that these microscopic beings followed the well-known laws of birth and life, so clearly exemplified in microscopic beings. Doctor William Roberts, at the time President of the British Medical Association, first, perhaps, among modern writers, associated these living beings with the causation of disease.

It was claimed by some that we had reached the end of possible knowledge in the genesis of disease. The thousands followed the footsteps of the leaders, or even began to be leaders themselves. All diseases were soon ascribed to the action of these micro-organisms. As a result, these little creatures, thus far unheard of, were called germs, and all germs were said to be pathogenic. A whole kingdom of nature, greater in number of species and a million fold greater in individuals than the other, the visible kingdom of nature about us, was suddenly endowed with diabolical powers. Every species, indeed every individual, in this kingdom of minute life was brought into the world to weaken, sicken and kill the higher animals and man. The influence did not stop with the creating of disease, but spread far enough and wide enough to account for all forms of evil and misfortune. Sin and folly, madness, insanity and old age, are no longer to be ascribed to the weakness of the flesh, the ravages of time, the wearing of the machinery, or even to His Satanic Majesty. All, all are due to germs, and all germs are pathogenic. Then the term "germ" was extended to include every living thing or bit of animated protoplasm, whose history and function are unknown. Thus the white corpuscle of the blood was soon made over into a germ and a parasite. It entered the body by way of the mouth, as a hiding yeast cell in a mass of leavened bread. Once entered and set free, it rushed to the blood and became the true factor of numberless diseases. One of the poets of England, perhaps the Poet Laureate, for I have forgotten his name, embalms this stage of so-called science in tragic verse. Singing a song of the corpuscles, he is inspired to say:

"The white make disease, the red make muscle—
I'd rather have the red than the white corpuscle."

Far be it from me, Mr. President and gentlemen, to attempt to turn into ridicule any true discovery in the great field of science. Still less to throw one doubt into the mind of any person in regard to the great doctrine of the "germ theory of disease." No discovery of your lifetime has been of more value, or has had such far-reaching effects. We are here to-day because we believe in that theory. Sanitary science is based upon that as a foundation. Take that away and we have nothing left upon which to stand. Nevertheless may it not be true that we have allowed our leaders to claim too much for the theory? May it not be possible that we are neglecting one entire side of the question? In short, may it not be possible that there are in this under world of life thousands of forms and countless millions of individuals, who are working for our best interests either directly or indirectly, and to whom we are indebted for very much

of our health and much of our pleasure? May it not be possible that there are "germs of health" as there are "germs of disease?"

As no human being is entirely bad, so, probably, no group of animals or plants is wholly noxious. A weed has been defined as a plant out of its true place. Many species which seem to us now as of no value, or even most injurious, might prove of great importance if changed in habitat or used for some other purpose. The milk-weed of the pasture is to be the future source of our india rubber, and you may live to see it planted by the hundreds of acres.

The Solanaceæ, a very natural family of plants, containing many great poisons, like the night-shade, henbane, belladona and nicotina, gives to us among our other foods, the tomato, the potato, and the red pepper; and among our floral joys, the almost matchless petunia and still others not far behind it in beauty and interest.

So it does not seem probable that all forms of microscopic life are injurious to man and his associates, or that in all cases they produce disease. It is to this neglected side of germs and germ life to which I wish to direct your attention, and I can do but little more than that in the short time allotted to a paper before this convention, and considering the present state of my subject. While hundreds of volumes have been written about the germs of disease, while scores of laboratories have been erected for the critical study of the pathogenic forms, while experiments upon living animals have been made in such numbers as to excite world-wide interest and protest, little has been said about and few experiments been made upon the benignant germs, if such do exist.

All who are thinking at all upon these lines must admit there is some great agency of regeneration and purification of matter at work in the world. The graveyards of the country contain untold millions of human bodies in process of decomposition, as we call it. More animals, large or small, die every year than human beings. Organic matters, the excreta of animals, the debris of life, commerce and the several trades, are thrown upon or into our soil, and yet the soil survives it all. In a few months, or years at the most, all that goes into the soil as dead and decaying matter reappears as by a new birth, free from all that is gross and polluting. The soil has no unpleasant odor. There is no trace of decomposition. The ground is a little darker in color and much richer in plant-foods, but it is without offense to eye, nose or hand. More than that, if the demand upon the soil is no more than it can undertake, if you do not ask it to transform a larger amount of organic matter than is clearly within its powers, it does its task so completely that the water running through it is filtered and purified. What is there about us more important than the purification of water! Take the State over, how few springs are unhealthful. In villages and smaller towns, how many of the wells would furnish us with the most delightful beverage to be found in the world, if only man would be more cleanly and more particular as to his own habits. The ground is doing its whole duty in these matters.

It has long been known that this is the work of the bacteria within the soil. They are never found at great depths, in the lower layers of the subsoil, but near the surface, and in ground that is turned most frequently by the toil of the farmer. To these micro-organisms then are we indebted for this regeneration. These bits of protoplasm, so simple that their mode of working is not yet understood, are not man's enemies but his best friends. They are not germs of evil but germs of health.

It is equally true of species that live in the water. They do not make water stagnant, but they come into it because it is stagnant and attempt to renovate it. Late in the fall I arranged a small tank of water in my laboratory into which were placed some water plants and some fish, frogs and other animals. It seemed to be a very happy and healthy community. The water remained as clear as crystal. The plants had a rich, green tint, while the animals swam and hopped for very glee. The animals were at last all removed for laboratory purposes, and on one cold night in December, the fires ran low and ice formed over the water in the tank. The more delicate plants were killed. At once a multitude of new forms that no man could number, made their appearance in the water and on its surface. Bacterium termo, they are called by the student; germs

of putrefaction, they are called by the sanitarian. Are they there to destroy or make alive? Are they there still further to befoul the water or renew it? Are they germs of disease or germs of health?

I am quite willing to grant that the water in the tank soon becomes foul, and that an unpleasant odor arises from it. The task in this case is, perhaps, too great for the little bacterium. A half peck of dead plant attacked by a bacterium so small that a drop of water would be to it an Atlantic Ocean. Yet it undertakes the work and it will succeed. Is it not possible, rather is it not probable, that what these bacteria are doing while in battle with the dead filth in the tank, they are doing in every stream and lake in the world? For the greater bodies of water the battle would not be so unequal.

Probably not less than fifty species of bacteria and kindred forms are found in different portions of the intestinal tract of man. Many species occupy the mouth and its many recesses. Others are found in the stomach, while by far the larger number of forms are dwelling in the smaller or larger intestines. For many years these were all considered as germs and parasites. It is now known that they have much to do every way with the great work of digestion. They assist the several juices in disintegrating the foods and preparing them for solution and absorption. They assist in separating the nutriment from that which is purely excretal, and further upon them depends, perhaps entirely, the development of the conditions which lead to proper and healthful intestinal action. It is even possible that they have other important functions. Koch, of Germany, has found and described the germ of cholera. With few exceptions, the world accepts his leadership. Cunningham, of India, living amid the cholera in the place of its birth, and where it is always endemic, working at the same problem, finds no less than twenty-four species in the discharges of his cholera patients, only one of which is the comma bacillus of Koch. What means all the other types? Are we well enough versed with these forms of life to claim that they, too, are pathogenic? It seems to the writer far more probable that many of them are the germs of digestion and excretal action already mentioned, while others may be engaged in a gigantic warfare but on our side. Dr. Poole, of London, claims it is to these intestinal bacteria that excreta has its value as a manure. Very soon after excreta is voided from any animal, the bacteria, already present, begin their work of regeneration. Dr. Poole has a home near London, with one and a quarter of acres of land, upon which he applies constantly the excreta and household debris from twenty cottages, occupied by one hundred people. It is all taken care of by the benign bacteria in the soil.

The members of this convention will take off the hat to Metschnikoff, the great Russian naturalist, assistant to Pasteur for so many years. We have followed him through his lines of investigation. We have repeated many of his experiments. We have accepted his great teaching that the white corpuscle of the blood is indeed our guardian angel; that it is watching over us with the most anxious solicitude; that it never tires of its labors, but is forever engaged in patrolling all our coasts, ascending and descending all our rivers, armed and ready for an attack upon our foes. Not a day of our lives, not an hour of any day, probably not a minute of time, are we left to ourselves. Germs which do exist, and which do essay to enter our body at some exposed point, are met at once by an army of corpuscles, and a battle, a miniature Gettysburg, begins. The result depends upon the number of the enemy as compared with the vigor of our forces. If we have not injured ourselves by excess of any kind, victory is usually on the side of the corpuscles. It will be impossible to say how often our lives have been saved by these puny and yet mighty warriors.

I might go on further in this particular line of suggestion. In Paris and Berlin investigators in the development of toxine and anti-toxine have come to the conclusion that I have just presented. Here is a germ we will admit to be detrimental, a germ that produces diphtheria. We inject that in large quantities into the body of a horse, and we keep on injecting it day after day until at last the horse can stand a dose of 250 cubic centimetres of this poison, when one-tenth of a centimeter is enough to kill a guinea-pig. The amount that could be given a horse would be sufficient to kill 2,500

guinea-pigs. When we get the horse in that conditon, our next step is to tap the jugular vein, take out some of the blood and allow the serum to collect, and there is another poison that attacks the first poison, and we call it, for convenience, the "anti-toxine." We, who understand the physiology of it, have found that this force that is working in the horse is developing an antagonism.

One more illustration seems important. From all time, our mothers and wives have gathered milk from the udder of the cow and placed it to cool in a broad, open and shallow pan or crock. They could not tell us why they did it, except that all others did the same thing and it seemed the best way. We know to-day that there are more than two hundred species of bacteria which dwell naturally in milk and its many products such as butter and cheese. We know it is to bacteria that we are indebted for the souring of the milk with the proper acid. We now know it is to bacteria that we are indebted for the aroma of butter, which so delights us in June, and which we have hitherto attributed to the new grass. We now know it is to bacteria that we are indebted for the "ripening" of butter and the ripening of cheese. Insipid and tasteless in the extreme would be the butter or cheese that had not been brought to maturity by bacterial influence. In Norway, in Germany and in a few places in the United States, men have discovered the species which are the most useful in butter-making, and which give to that product of milk its most desirable qualities. They are producing these by "pure cultures" much as the baker or the brewer produces his yeast, and for the very same purpose. A certain quantity of the desired bacteria is added to the milk; the proper fermentation follows and "gilt-edge butter" comes as a necessary result. To-day the butter-maker, like the good Methodist, may sing, "December is as pleasant as May."

Now, the fact that I am trying to work out is, that while you are discussing the question of disease germs, and I do not want you to forget that for a moment, we ought to take up and study the germs that are antagonistic to these and will fight them.

When you were having your discussion this afternoon on the milk question, I felt that I wanted to join you and yet I knew I was going to have an opportunity a little later. It is true that you cannot decide as to the purity of milk to-day even by bacteriological investigation. I believe there are 200 species of bacteria found in milk that are desirable, and I believe that if we were to filter the milk and take those things out it would be the very worst thing we could do for the milk, and that when we boil it we do something nearly as bad. Professor Conn, of Connecticut, has been working in this line the last two or three years. He has just published a report of his work, in a little pamphlet sent out free to all, with reference to bacteria in milk. He has found a little bacterium in milk which for convenience he labels No. 41, and this is the most desirable of all the bacteria to him and others in Connecticut who are working in this line. He has actually gone to work and started a bacteria farm for cultivating bacterium No. 41. He raises it in large quantities and is disposing of it to the farmers who are making butter. As I have already intimated, when milk has been brought to a certain stage, if the cream is put into the churn and is treated in such a manner as to bring about the ripening, we have an excellent quality of June butter, no matter what month in the year.

What I want to emphasize is the fact that there are, perhaps, hundreds of other germs round about us that as yet we know nothing of, and which we have considered to be injurious, when, perhaps, if we devoted just a little attention to them we would find that they are antagonistic to all diseases, and perhaps, the very best friends we can discover.

The purpose of this paper will have been gained if a single member of this convention is made to have a new view on the subject of the world of microscopic life about us. Especially will it have been met, if a member of this convention is led to think with me, that these millions of forms are not all bad, but along with those which produce disease there are others which confer the greatest blessings upon mankind. The purpose of this paper will have been gained a thousand times if a single member is made to feel the importance of devoting time to the study of the benign germs, or

germs of health, even as time has in the recent past been devoted to the pathogenic germs, or the germs of disease.

President Wise: Gentlemen, you have heard this very interesting paper. We are now ready for discussion.

Dr. Ebright: I do not rise for the purpose of discussing this paper. I learned to my sorrow some years ago that the discussion of any subject presented by Professor Nelson is usually disastrous, but I do rise for the purpose of congratulating this assembly on the fact that they have had an opportunity to hear so interesting a paper upon so interesting a subject. [Applause]. And I congratulate them upon the fact that they have heard something this afternoon not to talk about, but to think about, and I believe that we will learn more by thinking about this question that Professor Nelson has so ably discussed, than we could learn by all the talking we had on the milk question this afternoon. Again I want to congratulate the gentlemen present. I know it is usual to congratulate the author of a paper, but I have never believed in congratulating a man on having done his duty, and having done it well. He has only done what was assigned him to do. He was our servant in doing this and needs no congratulations. We are the ones entitled to congratulations by reason of the paper we have heard. [Great applause.]

Dr. Calvin Hathaway, Health Officer, Edgerton: I will concur with the gentleman who eulogized the paper, but, Mr. Chairman, perhaps there are not twenty people in this room who can understand this argument. If there ever was a paper read before an intelligent audience, agnostic in character, that is the paper. That is about all there is in the paper, agnosticism. He has not told us to any dead certainty any facts. He simply wants to know whether or not there are germs that are creating diseases; whether or not there are germs that are destroying germs that are creating diseases. I have been a student of medicine for thirty-five years and have been inquiring into the pathology of disease all that time, and yet we are just in the beginning of pathology and etiology of disease as we were 100 years ago. If there is one thing that bears out the experience of a physician it is this, that while he has had no time to experiment, he has learned from men, he has seen what the facts are more than by theoretical proofs. We do not know anything about the question of contagion. We see in one house a patient suffer from diphtheria and two or three of children in the same house escape it. We see the same in what is supposed to be other contagious diseases. What do we know in fact as to the cause of disease to-day? As far as the milk question is concerned the gentleman told the facts all the way through. The fact is that every learned physician of this country knows that nearly one-half of the children of this country who are attempted to be raised on cow's

milk, die in the months of August and September. Why? We may take the utmost care in securing the milk and the greatest care of the milk, but it is a fact that the food for one child may not be fit food for another. I have been forced to use Mellin's food, but it is a fact, and the professor will say so, as he has, that the milk, cheese and butter are filled with living organisms and are very unhealthy.

We do not know the facts connected with the diseases to this day; and as far as the white corpuscles are concerned I understand they are considered scavengers in our system; but the question comes up, if there is a certain amount of these white corpuscles in the blood, then the patient has diphtheria and dies. How much and little do we know about the disease? We know this much that we have discovered something by which to inoculate a person to prevent small-pox. We know that Pasteur has rendered his name immortal, and that he has prevented disease in animals, probably through germs in the system that destroyed the germs of disease. The fact of the case is, the paper was excellent but it means nothing. We see sometimes in the same family one person die of tuberculosis and three or four escape, and the walls and carpets are filled with tubercular bacilli. We learn, that way back, there was something discovered by the ancients to dispose of or retard disease, and it was something they said that was similar to the disease. The paper is a strong paper, but how much has it taught us? How many facts have we learned from the paper?

President Wise: We will now be adjourned until 7:30 P. M.

EVENING SESSION.

THURSDAY, *January* 30, 1896.

President Wise called the meeting to order at 7:30 P. M., pursuant to adjournment.

Secretary Probst: Ladies and gentlemen, the exercises of the evening were to commence with an address of welcome by the Governor, but the Governor has been called to Chicago on very important business and is unable to be here with us this evening, so we shall not have the pleasure of hearing him. He bade me say, however, that he wanted some one

to express for him his sincere interest in what the boards of health are attempting to do in Ohio and to assure them that they will receive his hearty support.

President Wise: The first paper upon the program this evening will be by Mrs. Thomas L. Johnson, President of the Woman's Sanitary Association of Cleveland.

Mrs. Thos. L. Johnson: I fear I must preface my remarks by a little explanation. There is no such an organization in existence as the Woman's Sanitary Association of Cleveland. A number of ladies formed themselves into a committee to investigate the sanitary condition of our city. That work was done and the committee went out of existence.

WOMAN'S SANITARY ASSOCIATIONS.

By Mrs. Thos. L. Johnson, Cleveland.

"New occasions teach new duties," is one of Lowell's characteristic sentences, written on the occasion of a great crisis in our nation's history, when the rights of human beings were being trampled in the dust, with appeals to time-honored custom and ancient law. Never, perhaps, before, in the world's history, upon any other nation, or upon any other class of humanity, have "new occupations" crowded so thick and fast as upon the American people and the American women of the past decade.

Modern science and invention, together with the general increase of wealth, have so multiplied the helps in the work of the housekeeper as to have revolutionized the whole domestic system with the result of relieving the women of our households from much of the care and labor incidental to the daily routine of housework.

Naturally enough, at first, the result was an attempt to use the new powers along the old traditional lines—increasing the sum total of household labor in proportion to the increase in the facilities for doing it, until the home was like an emporium of bric-a-brac and needlework run mad, and the "philosophy of clothes," to use Carlyle's expression, became a "life-devotedness to cloth."

Soon the conservative element in her nature began giving way in the face of the new outlook. One after another old prejudices disappeared, and she sent her energies out over every broader fields of activity. With the age of women's clubs came the great danger—that energies be too much distributed and so robbed of their vital power.

The woman who to-day, surrounded by such a multiplicity of tempting avenues of usefulness and pleasure, can keep her head and her purpose, and resolutely devote her time and talents to so many enterprises, only as she can carry on successfully, is the notable exception.

The original form of woman's club has well served its purpose and is being outgrown. It was entirely a means of self-cultivation. It has given to women in general a training in business methods, in the powers of organization and more or less of general culture. But this is only generating powers of usefulness and is not an end in itself. The wiser women have long been dissatisfied with the dearth of practical results from club life, and many have been the efforts, more or less successful, to find the lever by which this power might be applied to the betterment of humanity.

I have little sympathy with the tendency to use the word "woman" as an exclusive or proprietary term, and none at all with the effort to make a rigid separation between the rights and duties of the two sexes. The world has been so constituted that by no possibility can any part be equal to the whole, even though it be the "better half," and

in no part of human life, so far as doth yet appear, can the best and most perfect results be attained without the co-operation of the two elements. And what I desire to point out, is merely her fitness for, and her opportunity to co-operate with all good citizens to uplift humanity along the lines of cleanliness and health.

Here, it seems to me, is a field where may be used, not only the powers generated by social and club life, but those other sometimes despised, to often under-rated powers, peculiar to her own, gained through her long service as house and homekeeper.

The needs are great and pressing.

Possibly the one great need in our country to-day is the need of education. We need to know our own conditions, possibilities, dangers; and along no other line are we more in need of enlightenment than of our simple bodily preservation. The changes have been so rapid, from the country village to the great metropolis, from the conditions of the farm on the prairie to the crowded tenements of New York and Chicago, almost as the turn of a kaleidoscope. Men cannot realize that methods of yesterday are entirely inadequate to meet the demands of the conditions of to-day. Not only that, but science has been making great discoveries these later years, and discoveries that are big with meaning to the sanitarian.

Nothing can be more in evidence to the careful observer of human nature than the fact that the most common, obvious and ever-present facts of every-day life are by the ordinary individual least known and understood. Two of the basic facts of man's life, and the constant element of every day and hour, are the production and consumption of food, and upon the quality and preparation of it for our use, together with the disposal of the waste or refuse incidental to these processes, depend in large measure the preservation of the race. Ignorance and careless indifference to means and methods in dealing with these conditions have made a special means of education and coercion necessary, and has evolved the sanitary association, whose mission it is to create the public sentiment which demands wise laws and insures their enforcement. The great mass of mankind in our cities must be made to know what the existing conditions are, and their significance before there can be much hope of a permanent betterment. For a portion of the duties entailed, women are peculiarly fitted. First, they have time, which men have not. In the hurry and scramble of "making a living" in these modern times the business or professional man has little time to give to anything outside his private home duties and his business. The modern inventions in labor-saving machinery have not released him from the burdens that have been lifted from woman's shoulders. The investigations and study necessarily incident to the work of the sanitarian means the expenditure of not a little time, thought, strength and patience. Then for centuries her whole life was devoted to caring for the health of her family and the wholesomeness of her home. She has had to deal for generations with the very problems that confront the sanitarian, at their source, in the home. I am inclined to believe the first work ever done on these lines was done by women, and that it was the nostrils of a woman that first found offense in the refuse from the family food, and put it outside the wigwam or cave, and it is suspiciously like primitive housekeeping to put in to the fire or under the ground unsightly and offensive objects.

The very first requisite for cleanliness is to *see* the dirt, and as to her qualifications for that all mankind can bear witness in the words of the small boy, who complained that "mother always made such a fuss about a grease spot if 't wa'nt bigger'n your hat." But were we to take the testimony of the streets of most of our larger cities, we would be constrained to conclude that this most important requisite was conspicuously lacking in the equipment of the "city fathers." The boundary line of the curbstone, where the home housekeeping—always conceded to be "woman's sphere"—ends, and the city housekeeping, thus far in history usually the sacred prerogative of the sterner sex, begins, would hardly be mistaken by a blind man, with a nose to his face. But why should there be any boundary line, and why should not the experience gained in the smaller domain be utilized in the larger, and woman contribute her share in larger housekeeping

as well as demand that man contribute his share to the smaller? Indeed, we women are more vitally concerned in these questions of city housekeeping than are men, if possible. Upon her fall heaviest the burdens of sickness and death. It is her more delicate sense that is outraged by the general filthiness of public conveyances and thoroughfares. The results of all her care and watchfulness for the cleanliness of her own home and the health of her family are brought to naught by the conditions just outside her yard brought out by the city housekeeping.

With the plumbing in our houses and the proper drainage of our private premises, woman's supervision ends, and with the water supply that may bring back this very drainage into the home, with far more deadly results, she will have nothing to do.

I think men's methods in general may be characterized by the term "machine methods;" all sentiment and personality excluded as much as possible. The exigencies of business life demand this, and all his experience fosters it. Women are often criticised because they are unable to use these methods, the fact being lost sight of that in the department of life in which they rule, these methods would be impossible. While both methods have been abused, yet both are perfectly ligitimate. In this domain of city housekeeping both are needed. Human life, happiness and usefulness and moral responsibility enter into these problems as well as the matter of dollars and cents. The general health and well-being of the community are considerations of the first importance, and only along with these can "all the other things be added unto us." The present methods of so-called machine politics cannot solve such problems. In the present condition of affairs in most of our large cities, the officers, whose duties are the protection of the public health, are given their positions, not for their fitness by experience and training to execute the duties of the office, but because they are adherents of one of the political parties of the day. As good a qualification for their duties as would be the shape of their noses. Necessarily their term of office is governed by equally unimportant and accidental conditions. To be consistent we should choose our family physician for his adherence to some social code or church creed, and should employ in turn all the medical practitioners who belonged to that particular party, regardless of "school" or fitness.

This brings me to another circumstance which I think contributes very largely to the peculiar fitness of women for a share in these reforms, one which I think even she herself has never rightly valued—her entire exclusion from politics. For her, that most insidious and disturbing element cannot come into the problem. She can see the issue entirely uninfluenced by any personal bias along the lines of party affiliations or official preferment. She has no political favors to ask or give.

It seems a little strange that with the vital interests she has at stake in the management of this department of municipal government, and with the many elements that fit her for a share in it, she has for so long ignored her responsibility. For long years she has been foremost in philanthropic and moral reform, and in every one of these the elements of cleanliness and wholesome ways of living are factors of vast importance; how vast, even the wisest dare not predict.

Every citizen, whether man or woman, is responsible for the unsanitary conditions surrounding his fellow citizens up to the limit of his power, whatever form it may take—money, influence, experience—to make the municipal housekeeping such as shall conduce to the equal good of all. Our responsibility for death, disease and crime among the less favored classes ceases only when the conditions under control of the municipal government are as good as they can be made.

The first Woman's Sanitary Association formed in this country, so far as I can find out, was twelve years ago in New York City. Fifteen ladies residing in the east side of New York formed themselves into a committee to protest to the city government against the slaughter houses in that vicinity that were becoming an intolerable nuisance. They very shortly found that relief in that direction meant much more than protests, and probably a struggle of some months, at least, with official greed and public indifference.

For efficiency they formed an association afterwards christened "The Ladies Health Protective Association of New York," a name which seemed a happy inspiration, and which has been adopted by a majority of the similar organizations formed since. Only after ten years of persistent effort was their original purpose accomplished, and in 1894 a million-dollar abattoir, characterized by every humane and sanitary improvement known to science, stood upon the site of these pestilential slaughter-houses. In the meantime, however, they accomplished many other things no less important for themselves, their city, and the whole country. They demonstrated woman's power and fitness to cope with these questions. What may be accomplished by the same methods, perseverance and tact, employed in church and general philanthropic work, without the aid of political wire-pulling or the descent to questionable methods? They formed committees to investigate the water supply, gas houses, school hygiene, street cleaning, garbage disposal, sewer system, sanitation of prisons and tenements, and in several instances influenced the legislature to pass sanitary laws. The results are such as cannot be tabulated in rows of figures or computed in dollars and cents, but a gentleman in position to know reports the woman's work the most potent force in the work of reform in New York City.

In 1890 the Woman's Health Protective Association of Brooklyn, N. Y., was organized, which now has 1,000 members with five local branches, which meet twice a month for study of practical sanitation. Three years after this organization they played a very important part in the election of Hon. Chas. A. Schreien for mayor.

In 1892 was organized the Municipal Order League of Chicago, which was instituted and officered by women, though the membership includes both men and women. The achievement of this organization best known to the world was the appointment, through its influence, of Miss Adams, of Hull House, to the office of garbage inspector for the city of Chicago. They have established public drinking fountains, started a movement for the disposal of the papers, etc., that litter the streets, by the erection of waste paper boxes in conspicuous street corners, and have begun a crusade against what Emerson called "the fury of expectoration," by influencing managers and owners of public conveyances, theaters, etc., to maintain rigid rules against tobacco chewing. An organization in Indianapolis calling themselves the Indianapolis Sanitary Association, composed of women, so far as I know, but not excluding men, has five standing committees as follows:

Law, suppression of dodgers, clean sidewalks and public buildings, street cleaning and literature.

One feature of this organization I wish to call attention to as one of importance, both for its excellency as to method, and its perfect adaptability to the requirements in the case. When upon investigation any nuisance is found, or violation of any law or order of the city, a report of it is sent to the board of health made out upon a printed form: "To the commissioners of public health and charities: We call your attention to"—giving street and number—"as needing immediate attention because of"—then follows the complaint signed by "Woman's Sanitary Society, by" followed by the name of the secretary. The complaint is investigated by the board of health and such steps taken as are deemed necessary. These are recorded upon the back of the form, and it is returned to the society where it is filed for future reference. The name of the person sending in the complaint is known only to the board of the Association.

Among the youngest of these societies is the Woman's Health Protective Association of Philadelphia, organized in 1893 as a committee of that woman's club so remarkable for the impetus it has given to all the philanthropies of the women of Philadelphia—The New Century Club.

Possibly, for the reason that it is the youngest and therefore heir to all the results of the experiments of earlier years, this association seems to have established its work on a broader and more comprehensive basis and to be extending its influence along longer lines than others have done. In its first annual report it defines the province and the need of these societies most strikingly. It says "The men make the laws, award

contracts and pay the bills; the execution of the contract lies with the contractor; the supervision of the work with the women. When we consider that every life saved to our city means just so much added to the world's working force; when we think of the amount of misery caused in each home by every case of sickness; the enormous amount of capital invested in huge institutions to take care of people *after* they are sick, and when we know that if the principles for which each committee stands are carried out, a far greater result will be obtained in preventing misery and wretchedness, by preventing sickness than can possibly result from an attempt to heal after the misery has come, we faintly realize the magnitude and importance of the work we have attempted."

The first committee to get to work was that on contagious diseases, whose activities have embraced, among many other things, the endorsement of a bill in the state legislature providing for inspection of all cattle farms in the state, with reference to their sanitary condition and the prevention of tuberculosis; also, the establishment of a pay hospital for contagious diseases.

The street cleaning and garbage committee, in addition to the usual work of such a committee, personally visited the slum districts every week. Besides these there are committees on the water supply, sweating system, a trolley committee, whose work is outlined as urging the importance to public health of running more cars, to avoid overcrowding, of vestibules for protection of motormen, the adopting of fenders, longer straps to accommodate women and children, and conspicuous signs forbidding expectoration; a literature committee to study the literature of the day for all matters pertaining to sanitary subjects. Two other committees are in process of formation; one to visit public institutions and the homes of the poor, with a view to devising means for better and more healthful living; another to investigate means and methods for purifying the air of the city.

In no one of these organizations do I find much, if any, emphasis laid upon a line of work which seems to me to hold a promise that almost no other has, and that is, work with the children through our public schools, the recognized and established means of education. To bring an influence to bear here toward more and better instruction regarding the common, practical facts concerning personal health and sanitary living, general cleanliness and tidiness, would not only help to solve many present sanitary problems, but would help, to make our schools what they ought to be—institutions for the equipment of our American children for their duties in life—the making the world better for their having lived in it.

There are other societies that are doing more or less of this work of protecting the public health, notably those classified as municipal reform societies, under various names. My own very limited experience leads me to think the work can be better done by the separate organization under a name more specifically defining the purpose. These associations touch at some point every other force in the community that makes for the betterment of society, and must avoid even the appearance of the aggressive spirit. Rather should the motto be, co-operation with all for the common good.

So far as I know, there is not such an association in our State, nor has there ever been, on the part of women, more than a few spasmodic efforts to better the sanitary conditions of our towns and cities. This is certainly not because there is no need. Speaking of the city of which I have most personal knowledge, I only voice the sentiment of every right-minded woman within it and the opinion of every "stranger within our gates," when I say the sanitary conditions are a disgrace to a civilized community. And if current report is to be believed, the sister city of whom spotlessness and a conscience void of offense is characteristic, has yet to be discovered. We seem driven to one of two conclusions: Either the women of our towns and cities are entirely indifferent to the cleanliness of their own surroundings and their moral responsibility for the health and well-being of the communities in which they live, or that the "new occasion" has not yet taught them their "new duties."

The President: Inasmuch as Mr. Hartzell's paper is along the same line of thought "The Border-Land of Sanitation," we will now hear his paper before the discussion.

THE BORDER-LAND OF SANITATION.

By Josiah Hartzell, Ph. D., Member State Board of Health, Canton.

While the beginning of medicine reaches back beyond Hippocrates, intelligent, organ zed sanitary effort is only about three decades old. It is, nevertheless, true that the world's diminished rate of mortality is, to a greater extent, due to this form of effort than to improved methods of treating disease. Preventive medicine is more powerful and far-reaching. Not only is prevention better than cure, but it is easier.

When the fact once became clearly outlined that the health of the tree depended on the health of the twigs farthest removed from the trunk; that the health of the state was the proper subject for universal concern, there was naturally a good deal of floundering. An example of conclusions formed by cert-in parties is embodied in these ten commandments, considerably in vogue and widely published more than twenty years ago, under the head of "The Ten Health Commandments":

First. Thou shalt have no other food than at meal time.

Second. Thou shalt not make unto thee any pies or put into pastry the likeness of everything that is in the heavens above or in the water under the earth. Thou shalt not fall to eating it or trying to digest it, for the dyspepsia will be visited upon the children of the third and fourth generation of them that eat pie; and long life and vigor upon those that live prudently and keep the laws of health.

Third. Remember thy bread and bake it well; for he will not be kept sound that eateth his bread as dough.

Fourth. Thou shalt not indulge sorrow or borrow anxiety in vain.

Fifth. Six days shalt thou wash and keep thyself clean, and the seventh thou shalt take a great bath; thou, and thy son, and thy daughter, and thy man-servant, and the stranger that is within thy gates. For in six days man sweats and gathers filth and bacteria enough for disease; wherefore the Lord has blessed the bath-tub and hallowed it.

Sixth. Remember thy sitting-room and bed-chamber to keep them ventilated, that thy days may be long in the land which the Lord thy God giveth thee.

Seventh. Thou shalt not eat hot biscuit.

Eighth. Thou shalt not eat thy meat fried.

Ninth. Thou shalt not swallow thy food unchewed, or highly spiced, or just before hard work, or just after it.

Tenth. Thou shalt not keep late hours in they neighbor's house, nor with thy neighbor's wife, nor his man-servant, nor his maid-servant, nor his cards, nor his glass, nor with anything that is thy neighbor's.

Such of these precepts as have merit would now be classed as hygienic and personal, and few of them bear any relation to the state medicine of the present day.

One efficient auxiliary in the development and spread of real knowledge was the Sanitary Science Club of Boston, organized sixteen years ago. This club's membership is entirely composed of women. It will serve to exhibit some of the features of sanitation about which women naturally concern themselves if I enumerate some of the topics which engaged the attention of this club, permitting to myself, in passing, a few comments on the same.

First. *Intemperance.*—Everyone knows that womanhood is the instinctive foe of alcohol. If woman has classed abstinence as the first and most important of sanitary reforms, has she gone far wrong? It has been authoritatively declared by a physician

of great reputation that inebriety is clearly more prominent as a cause of disease and degeneration than all other factors known at present. The proportionate number of defectives due to inebriety has been tabulated time and again. Estimates vary, the highest and lowest, emanating both from America and Europe being as follows: From 10 to 60 per cent. of all insanity; from 30 to 80 per cent. of all pauperism; from 60 to 90 per cent. of all criminality; and 30 per cent. of all idiocy. British public health associations are doing much to place this subject on a scientific basis. To that extent, at the very least, American boards of health should co-operate in any effort made to restrict and to alleviate the ills due to unrestrained alcoholism.

Second. *Novel Reading.*—If an improvement in the moral health was aimed at, this subject is entirely pertinent. The everlasting repetition of the ups and downs of impossible young men and women read about in the average novel leaves the mind and body of the reader flat, exhausted and empty. The habit breeds contempt for democracy, and holds up a mirage of baronial castles and coronets, and marriage with some alleged European noble as the goal of ambition. The reading of youth enters into the mental substance; it precipitates a deposit in the mind which will always remain. Perverted pictures of life lead to a perverted life. No wonder the Woman's Sanitary Club, in view of these evils, asked: "What a food for an immortal mind to live on year after year as its principal nourishment! What sort of a mental fibre must it produce?" Of course the standard and wholesome fiction is not the kind which is aimed at.

More in harmony with the causes directly affecting health was the discussion on the sanitary preparation of foods, and on

Third. *The Old Ice Chest.*—Not only is it most pertinent, but it is a thing eminently in the domain of the housekeeper. If the chest is not thoroughly clean it is wrong. If it is unventilated it is wrong. [If it is connected directly to the house drain it is wrong.] Storing the remains of a boiled dinner, most quick to decompose, in such a box with uncooked meats, fish, fruits, custards, milk, etc., is dangerous. The absorption of foul air by these things produce maladies that are most wrongfully charged up as the act of God. Milk absorbs impure air as a sponge does water. Strong men might sometimes use it without harm, but to feed a baby tainted milk is a sin and a crime. The punishment is cholera infantum and death. Such, in brief, is the teaching of the Woman's Sanitary Club, and the doctrine is sound.

Fourth. *Marriage.*—Is a topic which gets much attention from this association. The general trend of belief is thus summarized by one member: "He who marries for love, gets a wife; who marries for position, gets a lady; who marries for fortune, gets a mistress. If you are sick, your wife will nurse you, your lady will visit you, and your mistress will inquire about your health. If you die, your wife will weep for you, your lady will lament, and your mistress wear mourning."

Matrimony is viewed in its most interesting phases, too many in number to admit of mention. Among the rest they discuss: Marriage and its foes; maternity and its foes; age of marriage, and of consent; decadence of marriage; marrying drunkards; marrying tuberculous persons—all topics of tremendous import to the future welfare of mankind, as can be proven, in one salient instance, from the minutes of the Ohio State Board of Health. On March 12, 1894, Dr. Probst, Secretary of the Board, addressed a series of inquiries in regard to consumption to the physicians of Ohio. He received 1,182 responses, reporting 5,342 cases. These answers also recited the particulars in the cases of 477 deaths from consumption, the disease in each instance having been communicated by a tuberculous husband or wife to a person whose family history had hitherto been free from all taint of the disease.

Fifth. *Poverty and Health.*—In the ranks of women there is very thin representation of those strong-lunged political pessimists who draw pictures of the few millionaires riding rough-shod over the great crowd struggling beneath in every form of alleged misery. Woman is the life of all wholesome social life; she dispenses the charities of the world, she ministers to the afflicted. She knows that impoverished moral and

physical health are only too apt to be the handmaids of a very impoverished purse. But she also knows that this moral and physical decay is almost equally at work among those at the top of the ladder. The uniform diminution of the sick and death rates during seasons of financial depression in America seems to justify the belief that most people are prosperous enough to indulge themselves hurtfully, and that the enforced restrictions of hard times are sanitary blessings. The views taken of this topic are too diverse for satisfactory characterization.

Sixth. *Health and Morality.*—The Sanitary Club believes that there would be much less sin in the world if everybody would learn to live more reasonably. That it is high time that reformers commenced, first of all, to preach the gospel of good health. That clean morals and a clean skin are apt to be chums. It takes no stock in the doctrine taught by one of the "fathers," that the purest souls are to be found in the dirtiest bodies; and it is no admirer of the saint who was thought to be of pre-eminent holiness because he allowed his hair to clot with dirt, and had three hundred patches on his pantaloons.

Old Dr. Abernathy used to say that "Every sick man is a rascal." On the other hand the drift of certain alleged religious books is that the sickly are most apt to be good. These extremists are inconsistent and demoralizing. The club teaches that it is a good and pious thing to be healthy, and that total depravity is most apt to be a sequence of total indigestion. "Good health" never knew any young man to be thoroughly wicked who took good care of his body. One of the best omens for the future generation is the fact that quite a number of the states in the union have, within the last few years, passed laws making the study of hygiene, including temperance, compulsory. Ignorance is the greatest foe to good health as well as to good morals. Let every friend of humanity join in the good work of spreading abroad the gospel of health, and the result will be a thinning out of the jails, prisons, poor-houses, asylums and hospitals such as would astonish the world.

Seventh. *The Medicine Habit.*—If the habit of taking some quack concoction for every illness and uncomfortableness keeps on growing we shall soon need a cure for the medicine habit as much as for the liquor habit. There are plenty of nicely labeled, but worse than worthless, nostrums that are warranted to cure anything and everything, and they are advertised in such a way as to attract the attention of every nervous and chronic invalid in the land. They read the symptoms to which these cure-alls apply, and then invest in them. Women are the chief victims and sufferers. There are thousands of barrels of stuff drank every month, and tons of pills and powders taken by those who are ashamed or too stingy to consult a physician. If they happen to recover from their headaches, tired feelings or other discomforts, they credit it to the medicine. If not, they go straightway and get some of another kind. Every truly sanitary association should bear testimony against the ignorant use of these infusions of anodyne and stimulant, and the Woman's Club has given this feature very pointed attention.

Eighth. *Sanitary Fallacies.*—It is not so very uncommon to find a person filled with sanitary lore to such a bursting point as to be actually painful, but another kind of pain, mingled with shame, paralyzes him when his fallacies have been exposed. Thus it was with the mighty Theseus when, in seeking for a bride for his friend Pirithous, he descended into Hades that he might endue therefrom the fair Proserpine, who was considered the choicest flower of Pluto's dreary realm. Passing by without attack from him the three-headed Cerberus at the gates of Hades, and then in succession the snakes of the Furies, and all the other monsters that were placed along the passages to this subterranean cavern for the terrifying of each newcomer Theseus began to imagine that he must be of lordly extraction, since the very devils in hell were not allowed to touch him. And thus reflecting, he seated himself on a stone by the way to rest a while, and to meditate on his own greatness. And there he sat and rested in high-browed contemplation, intending to rise that he might continue his search, he found that he could not do it. Only that and nothing more. There was no barrier in his situation—no devouring fire or flaming spirits to rend him. He simply could not go

up and go about his business. And there the story leaves him—sitting forever in hell and meditating upon his own greatness. It would be a sanitary fallacy to assume that the tribe of Theseus was confined to mythologic lore.

Womanhood was naturally most interested in the phase of thought that asserted that illness is so unreal that it does not exist at all, and that faith can heal all without trained medical intervention. The fantastic beliefs of these people have brought upon them the just ridicule and condemnation of all sensible persons. In their bushel of fallacies the mind or faith-curers have this grain of truth, that sickness which is not the results of disease or disaster may sometimes be cured by mental processes. This route back to health is, and always was, as well known to the good physician as any part of his therapeutics.

Other fallacies are pointed out, such as the propensity to overestimate the evil results of child-bearing, and an earnest inquiry is going on as to the physical trend of the higher female education. If, as statistics show, only fifty-five per cent. of girl graduates marry, what will this harvest be?

A comparison of the census of 1890 with that of 1880, under the heading of "Trade and Transportation," shows an increase of males employed in nerve-taxing occupations of 71 per cent., and of females of 263 per cent. To this cause of physical deterioration must also be added the effect of certain prevailing and destructive efforts to excel in the social and intellectual world. The comparative rarity of living, healthy children born to women most favored by society and fortune is a social phenomenon that is well worthy of attention. Clearly this sterility at the top must be made good by the less-favored classes or society would pass into a decadence that would eventuate in the extinction of the human race.

These pages bear little testimony of admiration for the new woman who purposely seeks to remain childless, or nearly so, but there are plenty of encomiums for the wife who accepts motherhood as a crown of glory, and around whom clusters the large family numbered by six and seven, nine and ten sons and daughters growing together in strength and beauty and developing the loftiest earthly ideal of that temple, we call home.

The enlargement of woman's political prerogatives gets attention; especially the relation of her physical life to such changed conditions as suffrage and official duty would involve. Objectors argue that, sociologically speaking, the duties of woman as a wife and mother are of the very highest importance; that hygienically speaking every mother should care for her own children; also that these duties are incompatible with the proper and continuous discharge of political functions. The other features of the discussion cannot be said to have any direct relation to private or personal hygiene.

The individual cup gets attention. Its adherents are called microbites, and it is declared that there is no safety for such persons but in a glass case with a glass stopper lest, they poison their own insides with their own microbes. Also the warning is given that no provision has been made against the micrococcus viscosus of the wine, and it is therefore suggested to the scrupulously hygienic communicants that they approach the sacramental offering equipped with a straw containing an improvised sterilizer through which this elixir of the new dispensation may be imbibed with safety. As a matter of fact a clergyman has invented a silver tube, now used in genteel city churches, which he claims puts aseptic communion on a sound scientific and prophylactic basis. The consistent advocates of aseptic communion are not without some good footing.

Ninth. *Heredity.*—This subject has an interest for all who concern themselves in regard to the health of the public that is far-reaching. Public health means simply the health of all—of every twig, therefore the pertinence of a wise forethought for the individual. Our physical and mental condition to-day is nothing more nor less than the resultant and quintessence of the thoughts ever had, and of all the deeds ever done, and of all the feelings ever cherished by ourselves and our progenitors.

Everyone remembers the saying of Dr. Oliver Wendell Holmes to the effect that he would commence the training of a child one hundred years before it is born. Such is

his expressive way of impressing the thought of the duty we owe to future generations, and the responsibility for present conditions which may be placed at the doors of generations past. He does not put it too strong when he thinks that three generations have a share in making us what we are. Indeed, the deeds of persons, be they good or bad, are visited upon many generations to come, if not upon all who are to live hereafter. This topic is too great to permit of the slightest elaboration.

Tenth. *Education of Children.*—This, both before and after school age, must ever be a subject of the very first hygienic importance. Prior to the school it is all confided to the mother, and now in most states woman has a voice in the public control. Primary schooling is universally entrusted to woman.

It would be impossible to over-estimate the importance of the mother's functions as a moulding factor in the first six years of life, as her future power for good or ill is only partially diminished by the requirements of the school. Children may be taught grammar and arithmetic, but more important than either is a knowledge of the laws of health. To secure a life that is really worth living, they must know how to avoid disease, and eat, drink, sleep, bathe and breathe. The old-time way was to teach the grammar and arithmetic and leave these more important matters to take care of themselves. The fiction was that a knowledge of the laws of healthy living comes by instinct. This is not more true of hygiene than it is of grammar. A good engine often outlives its maker because the maker has attended to it more carefully than to his own body. The Sanitary Club, in its review of education, has discussed many interesting questions, such as the Norway law, making girls ineligible for matrimony unless they are proficient in knitting, cooking and spinning. Also the proportion of life's miseries that is due to blunders in rearing children. Also, and most properly, the entire range of factors that promote or retard the highest physical development of woman.

The Woman's Sanitary Club takes rather unfriendly cognizance of the sanitary claims put forth in behalf of the new woman. There seems to be a conservative and settled conviction that, as a whole, the "new woman" movement has corrupted the stage, debased art, tainted poetry, corrupted literature, and that the alleged compensatory advantages to health are conspicuously absent. Man cannot rise to the same social and moral level with woman—why should woman strive to stand on man's lower level, which is the evident result of breaking down any distinction which God and nature has placed between the sexes? There is no more wholesome charm about woman than the modesty with which she envelopes her person—"the veil of Isis, woven by a mother's love, that hides the mysteries of the feminine form." The question plainly involves considerations that are partly of a physical, but chiefly of a moral nature.

In this most meagre review of the modes in which the efforts of the Woman's Club took form, we have been zig-zagging back and forth across the border-land of sanitation in its most restricted but popular sense. The most important part of the club's work was the publication of a manual for housekeepers, entitled, "Home Sanitation," a small but handsome and most useful book, published by Ticknor & Co., of Boston, that should have a place in every home in the land.

In the year 1888, Mr. Henry Lomb, of Rochester, N. Y., donated to the American Public Health Association $700, to be given as prizes for the two best essays on sanitary and economic foods—$500 as a first prize and $200 as the second prize The five judges, comprising scientists of national repute, adjudged the essays by number, being kept in entire ignorance of the authors. Seventy essays were submitted. The list of competitors was largely made up of professors, physicians and persons whose names were more or less known to the public. When the envelopes were opened it was found that the first prize had been awarded to Mrs. Mary Hinman Abel. Her essay was of such marked superiority over all the others that the committee refused to award a second prize. The American Public Health Association published Mrs. Abel's paper in neat book form, and it can be had by addressing Dr. Irving A. Watson, Secretary of the Association, Concord, N. H.

The city of Cleveland casts its sewage, and much of its garbage, into Lake Erie, and obtains its drinking water from the same source. This situation is fraught with forebodings of evil. Less than a year ago the civic federation appointed five ladies on its sanitary commission. In carrying out their work these women set an example that is most worthy of imitation. Each of the five members appointed an assistant, then each of the ten appointed ten assistants. Thus every foot of the territorial area of the city was brought under observation. The insanitary practice everywhere in vogue were reported back to the original committee. The report of the committee was formulated by the chairman, Mrs. Thomas L. Johnson, published in pamphlet form and given a wide circulation. A wave of popular impulse is now forcing upon the city of Cleveland the adoption of rational and comprehensive methods in the field most vital to her future growth and wellbeing, and the share of the representative women of that city in promoting this grand reform must assure to them the thanks and gratitude of present and future generations.

The ultimate object of quest with us all is happiness. Some persons attribute the highest happiness to the most learned; others to the richest, and others to the most powerful. True philosophy puts health at the foundation. Says Sterne, "O, thou blessed health, thou art above all gold and treasure; 'tis thou who enlarges the soul, and openest all its power to receive instruction and relish virtue. He that hath thee hath little more to wish for, and he that is so wretched as to want thee, wants everything with thee."

Another thus concludes his contrast between those two temporal blessings, health and money: "Money is the most envied, but the least enjoyed; health is the most enjoyed, but the least envied; and this superiority of the latter is still more obvious when we reflect that the poorest man would not part with health for money, but that the richest would gladly part with all their money for health."

Organized effort for the restriction of ills that afflict mankind is of recent date. It aims to limit the spread, and to abolish the causes, of infectious and contagious diseases; to promote more healthful conditions in schools and factories; but it is only in a general way, and in one of feeble effect at the best, that its lessons can penetrate the most important place of all, the home. Its ablest champions grieve over their weakness in this particular, and their most earnest inquiry is, "How can the home be reached and the children be educated so that the vital welfare of future generations shall be safely buttressed against the ignorance and short-sightedness that have wrought such waste of means and so great personal calamity in the past?"

After all, is it not through the wives and mothers of the land that the sanitarian's loftiest ideals of healthy living must be achieved? The priestess in the temple of health is Hygeia, a woman—a woman also the priestess and guardian of the temple of home. All the great factors that have shaped the world's progress and human destiny have passed under, and been moulded by her hand. She is the character-maker of body and mind, in babyhood, in childhood and youth. She it was who fashioned the hand that "wrought the statute of Memnon, and hung the brazen gates of Thebes; it fixed the mariner's trembling needle upon its axis, and first heaved back the tremendous bar of the printing press. It opened the tubes for Galileo, until world after world swept largely before his vision; and it reefed the high top-sail that rustled over Columbus in the morning breezes of the Bahamas. And it has held the sword with which freedom has fought her battles; it has poised the axe of the dauntless woodman, as he opened the paths of civilization; it turned the mystic leaves upon which Milton and Shakespeare inscribed their burning thoughts; and it secured, finally, the pen that signed the Declaration of Independence."

And, oh, mother! oh, woman, here is thy real throne! Here rulest thou the world not in the rude and selfish contacts and counsels of men, but in the home, where thou art the undisputed queen, and with thy own hand has fashioned those who rule, whether they be Cæsars, or Napoleons, or Gladstones, or Lincolns.

How vain are the average prognostics as to the secret mainspring of that power through which a great ecclesiastic sect has for centuries overshadowed the earth! One says it is divine authority; another, mysticism; another, organized strength. To him who is in touch with human nature there is no secret. It is not gold or zeal, or drastic discipline, but something a thousand times more powerful than all these. It is not the trinity of abstract mysticism, but it is the trinity of the virgin, and mother and child, the most perfect and gracious type of the purest, and dearest, and best of earth that can enter into the leaven of human impulse. And when the greater sanitation shall be ready to send its messengers, with healing on their wings, across the border-land of present endeavor, it will be woman's hand that will quench the deep causes of greatest sorrow and affliction, and her ministrations will carry to the world the glad tidings and great joy of the new dispensation with its untold blessings to health, happiness and home.

The President: You have heard two most excellent papers. We are now ready for discussion.

Secretary Probst: I do not wish to discuss this paper, but I certainly feel under very great obligation to Mrs. Johnson, who has come down here from Cleveland, not being one of us, but interested in what we are doing, and presented such an excellent paper and upon a subject in which I am sure we are very much interested. I would like, therefore, to move a vote of thanks of this convention to Mrs. Johnson.

Motion carried enthusiastically.

A Member: Will not some provision be made for the printing of these two addresses so that they may be distributed? I am sure that a great many people would like to have a copy of these two essays. I do not know what arrangements have been or will be made, but they ought to be printed in a large number.

The President: The proceedings will be published.

A Member: I would suggest that Dr. Probst tell us how to dispose of sewage other than by disposition in streams of water.

Dr. Probst: We have left on our program here after one or two sessions "the discussions of questions not upon the program," but it was not expected by me who prepared the program that I would be the one who would discuss the questions not on the program. If the discussion is started on any question I shall endeavor to take part in it, but I have nothing further to offer.

Mr. Hunter, Warren: Let me suggest that in my judgment there is nothing that is troubling small towns in Ohio more today than to know how to get rid of the sewage. We know how to lay pipe and how to make fall so it will run away, and know how to connect the houses with it. The question is, how to get rid of it when we get it into the pipes. If that has been fully discussed this afternoon, of course I will not ask it to be discussed again, but it is a subject everybody is inquiring about at the present time.

A. G. Comings, Oberlin: If the gentleman will visit Oberlin we can show him a sewage disposal farm that will give him some knowledge upon this question. We have a disposal system there which is the thing for all small cities and large cities, both in Ohio and the United States. I have in my pocket a circular which I will give to him or anyone who would like further information on that subject.

Mr. Hunter: I know Oberlin. I lived there a good many years and I know something about it today, and I know that Oberlin has a good, large duplicate upon which she can levy an assessment. And what will do for a town of that kind won't do for a town with a duplicate of $200,000, that will yield them under the lawful limitations an income of $1,000 to $1,400 a year. That is what is wanted. Now, I have no doubt, my friend, you have a good system. I have seen a good many of them. I have not seen Oberlin's. I have seen a good many that were good, but they were backed by people with money. I have in mind now a town of 1,000 inhabitants; it has a tax duplicate of $215,000, and it yields them under the statutory limitations a levy of $1,100. Out of that $1,100 they must pay their mayor; they have got to pay their marshal and policeman. They have no fire department, no streets to take care of and no sidewalks to build, and it takes close figuring to get through. Now, they have not the money to build an Oberlin establishment. They have splendid opportunities for sewerage. Nature has done all that can be done for the town. It is supplied with stone, with gravel beds; supplied with a deep ravine, almost a gully, and good fall in every direction.

Dr. Thomas C. Hoover, Columbus: I do not know that I can treat the subject to the fullest extent, and as fully as it ought to be, because it is one of extreme importance. But it has occurred to me while my friend Hunter was speaking, and I want to say that I know Mr. Hunter is as much interested in sanitary matters as any man in the State of Ohio, that the great difficulty in that town is the one that is usually met with whenever sanitary questions are brought forward. It is the intervention of the almighty dollar. The people with a limited tax duplicate, with a small revenue from it, are suffering from an accumulation of filth, and rather than over-tax themselves and spend more than the lawful revenue, they will wait until they are punished by a scourge of sickness that will deplete their village, and cost them many times more than a pretty expensive system of sewage disposal.

According to my friend's statement, this town has a great many of the natural advantages; perhaps has suitable soil for filtration, or several other methods for the disposal of sewage. Poor people cannot have luxuries. That is true, as a rule, but when it comes to a choice between unsanitary, unhealthy conditions resulting in sickness, and the expense of sewage

disposal, it does not seem to me that it ought to take them long to make a choice, and it strikes me that this is one of the cases where, perhaps, the women might exercise an influence that would be beneficent. They don't always stop to consider the almighty dollar. It would be a fortunate thing if there was a good sprinkling of them in this town. I hope they have their proper proportion. This question of cost is the one unsurmountable barrier to the establishment of perfect sanitation in all its various offices throughout Ohio. It is the cost of the disposal of the sewage that has led to the pollution of every living stream of water in this State, and the result is that a very large proportion of our citizens are dumping their filth right into their drinking water, and they won't remedy it because it costs too much money. I believe that it is not a question of *kind of method* of disposing of sewage one-half so much as it is the *cost of disposing* of it. There are several good methods, and I believe further that the method that should be selected for the disposal of sewage depends largely upon the local conditions, and that that which would be applicable in one locality or community will not answer in another at all. This we know in several instances; that is to say, unless you can have a proper soil for filtration that method of disposal, or intermittent filtration, will not be a success. It is the question of money that is at the bottom of a very large proportion of the sanitary problems, and if the money was furnished the majority of them would be solved.

Dr. Hathaway: I live in a town in which we have a sandy soil; we have got a good river, a large stream running to the side of the town which gives us good outlet for drainage. We have quite a good sewer some ten or twelve feet deep. In that way our town is well provided for. I recollect about five or ten years ago when the city of Ft. Wayne was making some preparation for supplying the city with water, and the question was whether they take it out of the same river or get it elsewhere. It was in fact a question of dollars and cents, and the question was brought up, where would they get the purest water. They sent a man from Ft. Wayne up the river and he came to my town and consulted a physician to ascertain how many deaths there had been from typhoid fever in the last year or two and how far it was from the river.

Now, it is a fact, or claimed to be a fact as the paper stated this afternoon, that the germ which will produce typhoid fever will float for miles, probably 100 miles, and it will be frozen in ice and thaw out and then produce typhoid fever.

Now, where are we going to dump this sewage? The city of Chicago lengthened out her water pipes and ran them farther into the lake. It is almost an impossibility to get a satisfactory answer as to what we will do with the sewage. The town I live in is fairly healthy, and yet it has an

endemic of diphtheria. We have had diphtheria in our town for ten or fifteen years, of the most deadly character. I have been health officer. Our wells are artesian wells; we have not an open well in the town. We have a sandy soil, good drainage and have removed our pigsties, look after the outhouses and have taken all the precaution that it has been possible to take, and yet I say to you we have had a yearly mortality of six or eight deaths from diphtheria.

A Member: What is your water supply?

Dr. Hathaway: Our water supply is a well, and it is down sixty or seventy feet deep. I have been unable to find out the cause of this. Now, we have heard in the paper about how much the ladies have done for sanitary affairs for the general public. I want to say to you that I am impressed with the fact that nearly every case of diphtheria is I think, from filth in the houses. I can go into a house and if they have got diphtheria, I think I can notice it by the odor, as the odor that comes from diphtheria differs from the odor from any other disease. I will notice in that house a peculiar smell that will almost drive me out of it, and there is where I found the dread disease. I have never found a single instance of diphtheria in a cleanly house. I cannot treat the cause in any other way, because as I said, we have met all the indications that hygiene requires and diphtheria is endemic there.

As to the sewage, I would like to know where you are going to carry it so if there is any deadly germ in it it will not produce disease? Ft. Wayne is more than 100 miles from our town, and I have read of instances where bad privies have drained into wells from ten to twenty rods away and produced disease. In clay soil there are seams which the water will follow and in sandy soil it will go down till it strikes the hard-pan. I am unable to say where you will drain it so that somebody will not receive the germ of the deadly malady. I have a paper that I intended to read here, but that under the circumstances I will not read, on that very subject. The facts of the case are that our small towns are not provided as the large towns are. The boards of health have but little money; the health officer does his work for charity. These are the facts in the case, and it is a fight with the man who owns his property who is keeping a nuisance if you get him to remove it.

Dr. Probst: I will briefly explain a sewage disposal plant which is considered to be one of the best in the United States. It is at the little town of South Framingham, Massachusetts. That is a town of about 5,000 or 6,000 inhabitants, and they bring all their sewage to a building where they have two tanks with a well between them. The sewage passes in through the tank on either side and passes over an upright piece of wood, which acts as a stop, allowing solid matter

to settle, and then out through a screen and into the well. From that well it is forced through a main about two and one-half miles to a piece of land outside of the village entirely. That land is very loose, gravely soil, with eight or ten inches of loam and sand on top, and underdrained by a drain about eight inches in diameter, the ordinary Akron drain pipe, with loose joints, placed six feet deep. There are a number of beds about an acre in extent and the sewage passes through the main carrier, which runs through the center of these beds, and by openings they can let the sewage out on any one bed that they wish to flood with sewage. The sewage passes out of this main carrier into a parallel ditch, that has a number of openings onto the land. It sinks down into the sand and gravel, and reaches the underdrains. I have samples in the office to show you. The sewage as it goes in is dirty looking stuff and the sewage that comes out is much better than you are able to get out of your Mahoning river. It is pure water and by chemical and bacteriological analysis it is shown to be very much purer than the average drinking water. There is a little town of 6,000 inhabitants that is providing for its sewage in a thorough practical manner. This question has been solved. There is no question about that. It is perfectly feasible for any town to purify its sewage. If everything is not as suitable as they have at South Framingham to provide for filtering it through land, which I consider the very best way, why they can do it as they are doing up at Mr. Hartzell's town, that is, by chemical precipitation. It is simply a matter of money, and Mr. Hunter has placed himself behind so many movements in sanitary matters that I shall be sorry to see him oppose any movements of that kind that may need to be brought about in his own town of Warren.

Dr. James F. Fitz-immons, Bucyrus: We have a town of eight or ten thousand inhabitants, and are situated, as you well know, on the Sandusky river about twelve miles below Crestline. The river, during times of freshets, conveys enough water within its banks to more than supply that city with all the water we need, but when we have had dry weather, such as we have had the last two or three years it runs very low, in fact it don't run at all, but stands still, and we had four or five sewers pouring their contents of filth into it, and the stench has become so loud that our citizens have concluded that they had better do something with it. We had the pleasure of having the secretary, who has just spoken, with us last summer and we discussed the matter somewhat informally at a called meeting, and we have concluded to commit the question of building an intercepting sewer, that is, a sewer that will intercept all these sewers that are pouring their filth into the river. We want to catch it during the

season of low water when the water is most filthy and convey it to the western part of the city. We expect to do that at an expense of $8,000, carrying it through a pipe sixteen or eighteen inches in diameter, and we expect eventually to dispose of it by a system of settling tanks, pump it out and allow it to percolate through the ground and return back into the streams. We think we can construct our sewers at an expense of $8,000, and we have concluded to submit that question to a vote of the people. We have to have the consent of the people before we can have any reform in this matter, and I believe this association can do very much to encourage and educate the people. The people are all right if you can only get them to think right. They have been accustomed to doing things in the old way, and they are not going to have innovations made if they cost money. But eventually I suppose every city and town in Ohio will have that system of sewage disposal. They will protect the rivers and streams within its borders. We ought to have clear, sparkling water through every town in the State of Ohio, and we can have it if we go about it in the proper manner. I believe the time is coming when we will have wholesome water in every town and city in our State. That is the problem we are now trying to solve.

Mr. Hunter: I rise to a question of privilege. I object to the last remark of Dr. Probst. He hopes I won't oppose the system of sewage disposal in the city of Warren. Great heavens! I am the first to defend it and I am the loudest talker now. I do not know how long ago it was, the State Board of Health did not hold meetings of this kind, but we had what we called a district meeting at Akron. That was several years ago, and I remember that the engineer of that city was asked to read a paper upon the subject of sewerage of Akron, which he did, and explained very fully their system, but the wind-up of the whole thing was that the sewage was dumped into a little stream of water, and then they called for discussion, and there were a great many in that audience that got up and eulogized that system of sewerage, I think I had the honor of being the last speaker, and I stated in that room that in my judgment the system of sewerage in Akron was no cause for congratulation. It fell like a wet blanket and the discussion thereupon ceased. I expected to be snatched bald right away, but there was no other talk made, and I think certain gentlemen have been thinking about that ever since. I am heartily in favor of allowing no sewage in the rivers and lakes of Ohio. We must come to it; there is no question about it.

Now, there is still a great question remaining. How shall the poor, not the rich, dispose of their sewage? The rich have found a way of disposing of their sewage without putting it into streams.

Now, my friend Hoover says it is a question of money, but I would

like to have that explained. The constitution of the State of Ohio enjoins upon the Legislature to place a limit upon municipal taxation. It is not a thing they have got a choice in, but it is something they have got to do, and if you will look into the municipal codes you will see that there is a limit upon every county and town and village in the State of Ohio, and my recollection is that the limit is five mills, and as the town gets larger it is less and less. Now, how can a village with a tax duplicate of $215,000 valuation with a limitation upon it of five mills, raise money to do this? How can you charge them with being backward, simply being a question of money? You say, get special legislation. Now, municipal legislation is a subject in every governor's message. Every governor for years that has transmitted a message to the Legislature has inveighed against municipal taxation and municipal debt. You go now with a bill to the Legislature and it is like pulling teeth to get a bill through to buy some trivial thing. Where can we look except to the sanitarian and the men studying these questions? At Warren we have the revenue; we have the money to waste and do waste some of it, and we can build a sewage disposal system.

Dr. Probst: Perhaps you have wasted it in trying to get a water supply?

Mr. Hunter: We have a good water supply. We have good water, as clear and pure as any water in the State. We are not making anything there.

I bring you back now to the little village I talked about, a village of a thousand inhabitants, with a duplicate of $215,000, and a mill to mill levy of taxes of $1.50, and their mayor gets $300 salary, no money to pay him. Many of these villages work in the same way.

Mr. Reed, of Hudson: I want a few words on that very question that has been raised in regard to the sanitary care of small towns. [illegible] is entirely practicable at present to organize [illegible] in penitentiary work and I speak without doubt from my own experience. When we went to work we organized the [illegible] we in the village have a thorough organization of the working force of the village male. I made that suggestion myself and by the aid we found every well in the municipality with [illegible] We went to work the first thing in order of the work to [illegible] and reorganize and to know what is in the village. We found that [illegible] with water which by any possibility [illegible] We found that it is an undoubted fact that some of the citizens would have [illegible] in the village as well as when we were in the village.

be kept dry so as to have no odor, the contents to be removed out of the city or else placed upon the surface of the ground and covered lightly with earth. I want to call attention to what seems to me to be a very ridiculous provision in our State law in regard to that, requiring the contents to be buried deep in the ground. Burying it has the same effect as the cess-pools or vaults in which the water goes down and is swept away into the wells.

A Member: Do you find that in the State law?

Mr. Reed: Yes sir; in the State law is the provision that it shall not be buried less than two feet. It struck me as one of the most absurd things I ever saw in human legislation. In our town of a thousand inhabitants we are not crowded. Almost every one has a yard of quarter of an acre. Now, the other most offensive slops are kitchen slops and washing slops, and if those slops are deposited near the buildings, unpleasant odors will arise from them. We have had some trouble with the council in our town, and we have sewers running through the town in every street. The sanitary board has prohibited connection of any of the house-drains, whatever, with these sewers, either the kitchen slops or the wash slops, but the council in two or three cases have given their permits to run kitchen drains into them, and to that extent they interfere with us very seriously in our work. We propose to fight it out and see to it that these drains are put to the only use that any system of sewerage ought to be put, and that is taking care of storm water. And unless people in our larger towns and cities can get some way of disposing of the most offensive of the sewage without carrying it into the streams and lakes, we might as well give up all attempts at sanitation, for it will be an impossibility. In some of the European cities as long ago as the meeting of the World's Fair at Vienna, details were given of some of the large cities in Europe in which all of these offensive materials were taken and disposed of by distillation, and I believe that system is practicable for our large cities. I speak from my own experience when I say that an expenditure of a few hundred dollars a year can put a village of a thousand inhabitants in perfect sanitary condition.

A Member: There is a question I would like to ask. How frequently do you have these vaults vacated, and who bears the expense, the owner of the property or the village?

Mr. Reed: The property owner in every case has borne the expense, either directly or indirectly. There have not been more than two or three cases since the first organization of the board where there has been any resistance on the part of the property owner to carry out the order of the board. When the sanitary police reports that a place needs attention he first issues a written order, and if he does not attend to it, it is brought

before the board and an officer goes and investigates, and if it is not done he sees that it is attended to, and it is collected with the taxes.

Professor Nelson: About four years ago I presented my card to Dr. Thorne, who has entire charge of sanitary matters in Great Britain. I told him I was interested in the question of sewage disposal and I wanted to see the best they had. He took me to one of his departments and introduced me to Major Tullock, Chief of the Department of Sewers and Drainage. As we sat chatting that afternoon—he was wonderfully obliging to give me his time—he showed me on the map the different towns near London where they were making efforts at sewage disposal, and he went on to say that he did not like to recommend a patented thing, but that he did want me to see the sewage disposal known as the Ferozone system. He very kindly gave me a card of introduction to the Secretary of the International Company, and through that secretary I had admission through the gate into the grounds at Hendon, a suburb of London, to see the sewage disposal. The town was on a hill and the sewage disposal works in the valley. The sewage was allowed to run out at the mouth of a pipe over a basket which I should say held about a bushel of matter. I looked at that basket and found it full of greenish material. I was not allowed to put my hand on it. It was a secret, a profound secret, as I understood. All I could do was to watch the results. About a bushel of matter, costing some $20 a ton, received all sewage of this village and purified it. A bushel lasted a few days; I do not know exactly how long. I spent some hours viewing the result, determined if possible to go to the bottom of the system. The sewage coming to this basket through the iron pipe was as filthy looking as any water you ever saw in your life. Within ten minutes after that there was a complete separation of the materials. There was solid matter and seemingly clear water, and this water was then run over a filter bed, composed especially for this work.

The filter bed contained, in addition to sand and other common ingredients, a black, porous and magnetic oxide of iron, called "polarite," insoluble in water and therefore practically everlasting. So much depends upon the construction of a filter that I will give you a diagram of the one at Hendon:

A number of beds are prepared so that no one need be in continuous use for more than *forty-eight hours*. This intermittent use of the filter is probably one great secret of its success. I spent four or five weeks in a quiet investigation, and at last discovered the chemical analysis, made by Roscoe, of both ferozone and polarite. They are as follows:

Ferozone.	per cent.
Ferrous sulphate	26.64
Aluminum sulphate	2.19
Calcium sulphate	3.30
Magnesium sulphate	5.17
Magnetic oxide of iron	19.01
Silica	11.32
Combined water	8.20
Moisture	24.14
	100.00

Polarite.	per cent.
Magnetic oxide of iron	53.85
Alumina	5.68
Magnesia	7.55
Silica	25.50
Lime	2.01
Water	5.41
	100.00

When sewage runs over a spongy iron it is clarified instantly, and at practically no expense. Of course the solid matter had to be taken care of after it was separated. It dropped into a receptacle, the clear water flowed away and the receptacle had to be emptied and the solid matter placed upon the land, where it became a very valuable ingredient of the soil. After the water had run out from the filter bed it was as pure as that which Dr. Probst spoke about. I do not know the exact cost of this system, but wherever there is a village that has a sewer with an outlet, and I suppose every sewer has an outlet somewhere, the sewage could run over a basketful of ferozone and over a filter bed of polarite.

Here the convention adjourned till 9:30 A. M. Friday, February 31st.

MORNING SESSION.

FRIDAY, January 31, 1896.

At 9:25 o'clock President Wise called the convention to order in the Y. M. C. A. hall, and said: Before we proceed I wish to impress upon you what I said yesterday, and that is, that I hope you will speak in a loud tone of voice, and when you rise, to give your name and address. I would also state that the acoustic properties of the hall do not seem to be very good.

The first paper upon the program this morning is by Dr. H. E. Welch, Health Officer, Youngstown, Ohio.

Dr. Welch—I would like to state before reading that there is an error in the program. The topic should read, "Prevention of diphtheria," rather than the "Diagnosis of Diphtheria."

THE VALUE OF BACTERIOLOGICAL EXAMINATIONS IN THE PREVENTION OF DIPHTHERIA.

BY H. E. WELCH, M. D. Health Officer, Youngstown, Ohio.

The study of bacteriology may be said to have had its beginning with the observations of Antony Van Leeuwhoeck, of Delft, Holland, in the year 1765; though it is during the past fifteen years that this line of research has received its greatest impulse.

From the very outset its history is inseparably connected with that of medicine, and as it now stands its relations to hygiene and preventive medicine are of the utmost importance.

In order to successfully and intelligently combat and prevent the spread of contagious and infectious diseases, we must first know the cause of the disease, its nature, the conditions favorable for its growth and the best and safest method for its destruction.

This is eminently the domain of bacteriology.

How much less a dread and scourge among the educated classes has Asiatic cholera become since, in 1883, Koch pointed out its specific cause in the spirillum!

Typhoid fever is less dreaded and more successfully treated since Eberth in 1880 pointed out its specific cause and that it is largely a water-borne disease.

Unfortunately the discovery of the cause of consumption has not done much to lessen the fatality, but scientific methods of disinfection and quarantine will ultimately lead to making it a less frequent disease.

The surgeon of to-day owes much of his success to the bacteriologist, who showed him why he formerly got pus, a long convalescence if not a fatal ending; simply because he did not clean his field of operation of the germ life that is everywhere present.

In the year 1883 bacilli which were very peculiar and striking in appearance, were shown by Klebs to be of constant occurrence in the false membranes from the throat of those suffering with diphtheria. One year later, Loeffer published the re-

sults of a very thorough and extensive series of investigations on this subject. He found the bacillus described by Klebs in most but not in all cases of throat inflammations which had been diagnosticated as diphtheria.

He separated these bacilli from the other bacteria present and obtained them in pure culture; when he inoculated these bacilli upon abraded mucus membranes of susceptible animals false membranes were formed and in many cases death followed. In 1887 further studies by Loeffer added to the proof of the dependence of diphtheria on the Klebs-Loeffer bacillus.

In the year 1888 the first portion of the results of the very important investigations of Roux and Yersin was published, and the dependence of diphtheria on the Klebs-Loeffer bacillus may be said to have been established.

With these facts before us, what advantages may we expect from bacteriological examinations in preventing diphtheria? Naturally, the first question an interested person would ask, would be: Are the examinations trustworthy? In answer to that question I will quote from the report of the New York City board of health for 1894, as follows:

"The examination by a competent bacteriologist of the bacterial growth in a blood serum tube which has been properly inoculated and kept for fourteen hours at the temperature of the body, can be relied on in cases where there is a visible membrane in the throat, if the culture is made during the period in which the membrane is forming, and no antiseptic, especially no mercurial solution, has been lately applied."

This is from an authority best qualified to give an opinion. Membraneous inflammations of the throat cannot be positively diagnosed by simple inspection. It is admitted by all physicians in this disease that it is often impossible, either from the clinical history or the anatomical lesions or both, to make an accurate diagnosis of diphtheria. There are no constant differences which separate the simple, non-contagious forms of inflammation from the diphtheric and communicable types, and it is only in a rather limited number of cases that an early and reliable diagnosis can be arrived at from data attainable. This uncertainty leads physicians to hesitate to report suspicious cases until the graver symptoms appear; usually by this time a large number of persons have been exposed to the infection. The persons who are to be subjected to the annoyance of the quarantine have the perfect right to ask for as positive evidence as it is possible to obtain as to the contagiousness of the disease before being deprived of their liberties. These disagreeable features may be largely eliminated by a bacteriological examination of the membrane.

According to the statistics of the New York City health office full forty per cent. of the cases reported as such are not diphtheria. Consider for a moment what that means to the State of Ohio, for it may be taken as a fair average the country over.

Four families out of ten quarantined for diphtheria, needlessly deprived of their liberties and incomes, which might largely be avoided by an examination lasting scarcely twenty-four hours, and at small cost.

One of the prolific sources of the spread of diphtheria is the so-called membraneous croup. Eighty per cent. of the cases of croup reported to the New York health department proved to be diphtheria. Usually the same thoroughness of quarantine and disinfection are not practiced in croup as in diphtheria, which is entirely wrong. The eighty per cent. of cases should be placed in their proper light by a bacteriological examination, and the danger of infection reduced to a minimum. We have been so impressed with this fact in our city that we have thrown away the croup cards and use only those marked diphtheria.

The complete disappearance of the membrane from the throat does not always mean that the patient is free from the contagion. Researches by various observers have demonstrated that the bacillus remains in many throats from three to thirty days after the disappearance of the membrane. Therefore, no one should be released from quarantine until repeated examinations show the absence of the specific germ.

Bacteriological examinations are of value in determining what the treatment shall be. If it is shown to be a case of diphtheria, then we should certainly use the antitoxine, not only for its curative action but also to immunize all those who may have been exposed. This remedy has been tried long enough to merit the approval of careful observers.

Another and very important reason, to my mind, why these examinations should be made in the large cities of our state, is because it is a step in progress, and we, as up-to-date sanitarians, cannot afford to occupy any but a forward position. Ohio has always been foremost in sanitary matters, and should not secede from that position by failing to adopt measures for public convenience and safety.

Mr. R. W. Hinton: I have a statement to make, following with a question. I have had for sixty days a family quarantined in our place with diphtheria and scarlet fever. The family is thus situated, in two small log rooms. The question is as to how to proceed to disinfect those rooms, with this family in them; and in addition, is there any way to destroy this property and to replace it? Is there any provision to that effect? If so, I would like to learn it.

Dr. Hathaway: I have heard a part of the gentleman's paper, and it is true it is a very good, scientific history of diphtheria and the maladies of the throat, but there is the question. As the paper states, there are so many diseases of the throat that have a considerable similarity, and doctors frequently get reputations for curing diphtheria when it is not diphtheria; but it is very frequently the case that this malady breaks out in some remote part in the country. It would be almost the next thing to an impossibility to have a membrane examined, and perhaps before it could be examined a number of people would be exposed to the malady. The paper states it would be great injustice to the community to quarantine a house. Now, that is true, but we should be careful and shun the least appearance of evil. It is almost impossible to get a scientific report as to whether it is diphtheria or not; as I said before, a large number of the inhabitants might be infected. I think it is well where we have a suspicion of diphtheria to quarantine the house. Contagion should be watched constantly, and we should make every effort to shut it off, and I kown that it can be done. I had small-pox in my regiment, and whenever it made its appearance I would have the man quarantined, and I never had a spread of it. It is true that those having the small-pox will have a modified form of it—varioloid. That will produce small-pox. With the diphtheria, a child may go to school with a moderate sore throat, a little indisposed, and the first thing we know the diphtheria will break out to an alarming extent. It is true that diphtheria may not be malignant, while a mild sore throat will produce most deadly diphtheria. I have seen it occur. and in nine cases out of ten where it affects the epiglottis they die. I never had but two cases to recover. Those

two cases were kept in the house, and one child was removed two miles away. At the time it was removed it was healthy, to all appearances, but it took the sore throat and died. Now, I suggest and believe it to be justice to a community that where we have the least suspicion of diphtheria that it be quarantined. I know that some may suffer financially, and it is not a good plan either to produce a scare in a community or town, but it is far better to be on the safe side. As to what shall be done with these very malignant diseases—and the law is very plain—if you have to destroy every vestige of clothing, if you have to destroy the house, the law provides that you will be paid for it. The best way to get rid of these things when your patients die or get well, is to shut that house right up and burn sulphur. It is the best thing you can do to renovate the house. Now, in Chicago a few years ago, the meat was spoiling in those large packing houses, and hundreds of dollars were being lost, and the proprietor went to Professor Hines and asked him if he could not suggest some way that they could prevent this. He said, "Yes sir, I can. Lock up your packing houses. Close them up as tight as you can, and burn sulphur." They did so for three or four days, and their trouble was all gone. It had destroyed the germ, and the packing went on and they made their millions. I think, for the safety of the community at large, that we ought to take the first step to prevent the spread of this disease, and in so doing we can afford to pay what waste there should be of property. Now, with regard to scarlet fever. It is a very difficult matter to diagnose between scarlet fever and diphtheria in the start. I have seen many cases of diphtheria and scarlet fever, and it was a question which the patient had until the rash began to make its appearance. The local boards of health should be right onto it. They should have the health officer put the law in force, and not permit ingress and egress to or from the house from that time if there is any contagious disease there.

A Member: The paper may be a very good one, but the majority of members in this house didn't hear any of it. Yesterday we sat in the rear of the house and we could hear scarcely anything that was said. To-day I took my seat in the center of the house, and failed to hear, and my hearing is good. It seems to me that the speakers do not try to make themselves heard. I would be glad if they would speak louder.

Dr. Fitzsimmons: I suppose there are a good many physicians in the house to whom the word diphtheria sounds a good deal like the firing of cannon during the war; it means war. It means that the enemy has entered the household and that there is going to be death or a battle, and it is between the physician, the nurse and the patient, and the patient generally gets the worst of it. Now, if we would adopt the same rigid rule with diphtheria that we have with the small-pox I think that

eventually the disease would be seldom heard of in the State of Ohio. But we have simply dallied with the disease until the germs have become widespread. They are in every community, and when a community becomes infected you know that it is very difficult to eradicate the germ. I believe, too, that it is folly to say that we may have something just like diphtheria and yet not have the germ. I believe the only way to eradicate diphtheria is to quarantine. Quarantine your patient strictly. Keep him in a room and permit no one to enter the room except the nurse and those who should do so, and I venture to say that in a few years diphtheria will almost entirely be destroyed, unless imported from other places. I think it is a fact that if this thing had been done there would not have been as many funerals in the State of Ohio. Compare the expense in dollars and cents of taking care of the patients, and the funerals. It ought to be a matter of self-preservation with the people of Ohio to see that this work is done. I believe the time has gone by when we should discuss and wrangle and quarrel about the causes of diphtheria. I believe that investigators of this disease have studied the cause of this disease carefully, and I think discussions on that line are not profitable. I would like to have an expression of opinion from the gentlemen here as to their use of toxine.

Dr. Unkefer, Piqua: I move that no man be allowed to speak twice on the same subject until other people have a chance, and that a man's time be limited to five minutes.

Motion carried.

Dr. Probst: There are not very many of our cities that have done anything in the way of bacteriological examinations. The city of Columbus has been for the past year or two making an examination of all cases reported as diphtheria by the physicians. Dr. Welch said in his paper that in the experience of New York City, at least forty per cent. of the cases reported by the physicians were not diphtheria. If you will figure up the amount of time that people are quarantined in case of diphtheria and see what the saving would be in loss of labor, and also the saving with the poor families that the board of health has to sustain, when quarantined, you will see that it would be a great advantage to the board of health if they had some way of settling this dispute as to whether it is or is not a case of diphtheria. The examination is a very simple one. The health department here has a small box containing a little glass tube with gelatine in it, and the other tube contains a cotton swab, and the attending physician has only to rub this over the membrane of the patient suspected of having diphtheria, rub the swab over the gelatine, send it to the bacteriologist and in twenty-four hours he is able to make a report to the attending physician or board of health as to whether it is

or is not diphtheria. It seems to me that that is a very important matter, indeed, and one that our boards of health should urge upon the authorities of their respective towns. It is true that in the small towns it will be difficult to find some one who will be competent to make the bacteriological examination, and that has been considered by the State Board of Health as to whether it would not be best to make some arrangement by which these culture tubes could be sent by the boards of health throughout the state to the State Board for examination where there was a case of diphtheria reported. One thing that stands in the way of such an arrangement is that the United States postal laws forbid the transportation of any disease germs by mail. At a recent meeting of the American Public Health Association a bottle was displayed which would be absolutely safe to mail, and a resolution was adopted asking the Postmaster-General to modify the postal laws so that these bottles might be transmitted by mail. I think that the State Board of Health, if we could succeed in getting what money we need from the legislature, would be very glad, indeed, to take up a work of this kind, and it would be a great benefit to the various boards of health.

One gentleman asked the question about a family living in a log house with but two rooms, as to what should be done in the way of disinfection. It is true, as a rule, that disinfection should be done by sulphur fumigation, for by sulphur fumigation you can reach parts of a room that it is difficult to reach otherwise. But many do not depend upon sulphur fumigation. We can disinfect a house by boiling all the clothing in it, burning such as should be destroyed, such as the bed clothing, and then by a very thorough scrubbing of floors, wood-work, etc., with a solution of bi-chloride of mercury. I think the house can be disinfected in this way while the family is still in the room.

As to the destruction of clothing and so on, the law provides that boards of health may cause the disinfection, renovation or complete destruction of bedding, clothing or other property when such action seems to such board necessary, and to the indigent poor it may replace clothing or other articles destroyed. That would be your authority for destroying their clothing, etc.

Mr. Bennett, Piqua: I am not a physician and not a minister. I am a member of the board of health of our town, and a go-between the minister and doctor—what they call an undertaker, [laughter] and I just want to ask a question and make a suggestion on this subject. In all the speaking on this subject in the case of contagious diseases, the talk has been about the patient after he dies or gets well. Now, isn't it a good thing to continue during that sickness to disinfect the house? There are disinfectants that can be used in the sick room and in the house where

there is disease that, in my opinion, are a great benefit in preventing the spread of the disease. Is it not a good thing to continue disinfection during the sickness of the patient?

Dr. A. W. Hopkins, Ashtabula: I have been much interested in the paper and am interested in the idea of having bacteriological examinations made in cases of diphtheria. I believe that it is of great use. I am a firm believer myself in the anti-toxine treatment, but I do not want to use anti-toxine at the price that it costs us to day, upon a patient that don't need it. If he has the diphtheria I want him to have it. I have looked over the matter of cost in our place to see whether we can afford it and made up my mind, that for the present, I should let it go. I quarantine every case of diphtheria that the doctor reports to me. I make it sure, if it is possible, that there shall not be any running back and forth. I then want thorough disinfection.

Now, the last gentleman that spoke thought that there would be some use of disinfection during the disease. I have made up my mind that there are precautionary measures that we can take so that there will not be a spread of it all over the house, but as long as we have got a sick patient there we have got the contagion in the house. We can, by careful nursing, keep the spittle and everything of that kind from being thrown around. Burning a little sulphur on a shovel or putting some carbolic acid on top of the stove as a disinfectant in the sick room to prevent the spread of a disease, is, in my opinion, useless, and is not only a good deal of annoyance to many people, but it does no good. If you could create a smell in the room that would be pleasant to the diphtheritic patient, that is grand and glorious comfort, that is what we want in the sick-room, but have no idea that you are going to stop the spread of the disease by that means. It seems to me a fallacy. I hope that the bacteriological study of diphtheria will continue. I hope that the time will soon come when every physician will have the privilege of having a bacteriological examination made and that that shall be used as an aid to diagnosis. I believe it is. I think that some of many patients by at least that it is a good thing, and then after I have had them with my skin goes back a great deal. I want some anti-toxine and I want it very

Now, there is another thing. I would have some organization of a good long time to put in use of diphtheria so as whether you would use anti-toxine. Now we could have a bacteriological examination and know inside of an hour as we could be pretty sure

Dr. Jennie Van City: With reference to the use of bacteriological laboratories. I think that I may say in behalf of practical and common application that they would prove a blessing to the community as I understand it. The State Board should have a part to perform in the matter

history of the disease as it is later, and if you can get some of the secretion, even before the membrane is poured out, and bottle it up and send it to some bacteriologist he will find the bacillus just as readily as in a later secretion, but if you wait till the membrane is poured out, it is absolutely unnecessary, because diphtheria is one of those diseases that after the exudation has covered the throat there is no doubt whatever about the diagnosis. Now, if we can establish this and make a universal application it will be valuable to all communities, but unless we can use it in the early history of the disease it will be absolutely worthless.

Dr. H. L. True, McConnellsvile: For the encouragement of the State Board of Health I wish to report our experience in McConnelsville. We used to have diphtheria there every winter. In fact, it was with as nearly all the time, but since they have been quarantining we have not had a case there in the last three years, and I do not know but longer than that. There were two or three houses in the town in which they used to have diphtheria every winter, and at the time the State Board of Health sent out their circulars telling how to fumigate and so on, we gave those houses a regular overhauling, and there has not been a case of diphtheria in them since.

Now, in reference to bacteriological examinations. At our place we have to send our specimens to Columbus. It took three days to send them and bring them back, and then, perhaps, the bacteriologist would require a day to examine it. Four days is too long to wait, and at our place we have no competent bacteriologist to examine them. I think it would be impracticable in places situated as we are. At our place last year it was reported in connection with the Ashtabula epidemic of diphtheria that they made bacteriological examination of the milk that had been furnished to the families that had the diphtheria and they didn't find the microbes at all. I have never found any trouble in making a diagnosis of diphtheria if there was a genuine case, and certainly we cannot wait four days to have a diagnosis made. I believe that by quarantining and disinfecting, and so on, we can control diphtheria almost as well as we control the small-pox. That has been my experience down in the Muskingum Valley.

Dr. Ebright, of Akron: The question of bacteriological examinations is one in which I am especially interested, and in which I have had some experience, and I do not know but if I were to tell my experience so far as the treatment of anti-toxine is concerned, which I understand does not enter into this discussion at all, I could stir the soul of every man in this house to its very depths. I am a firm believer in the establishment of bacteriological examination in every town and village in this State. And to show you why I believe that, I want to relate my experience as

health officer in our city. I have been, for the last year, in the city of Akron tabulating the expenses and making an estimate of the expenses of contagious diseases, to the citizens of that place each month. The first of March I will be able to publish to our citizens, and to the people of this State, what it has cost the people of our city for diphtheria, scarlet fever and other preventable diseases. About six weeks ago it was my duty as health officer to call upon a family that were suffering from the affliction of the loss of a child. The history of the case was something like this: The child was taken sick on Tuesday, with what the doctor diagnosed as spasmodic croup; on Wednesday she went to school; Thursday she was taken very sick, and on Thursday night the doctor stayed with her all night, and Friday morning she was a corpse. I visited the house for the purpose of learning whether this was a case of spasmodic croup that had killed this child, which I did not believe to be true, and do not believe now. And while I was morally convinced that it had been a case of laryngeal diphtheria, I had no way to prove it. The consequence was that all there was left for me to do was to talk as kindly to the family as I could; to suggest to them the necessity of perfect disinfection of that house and the clothing, but I said to them, now with the right I have, I do not believe I have authority to order this done, but if you will follow my judgment in this matter you will disinfect this house thoroughly, clothing and everything in it. My judgment was not followed, and in five days a virulent case of diphtheria prevailed in that house. The house was immediately quarantined, but the child, after a long siege of illness, recovered. What would a bacteriological examination have done for that family? A bacteriological examination of that first child's throat would have proved conclusively and beyond peradventure of a doubt what was the matter with the child.

Some one over here said that he did not know whether they could afford to go to the expense. I want to say to you, gentlemen of the State Board of Health, that the life and the health of a single child in this state, the permanent health of that child, is worth all that a bacteriological board would cost in any village or city of this state. [Applause.]

Some one said they had no man in their village who could make a bacteriological examination. Let him buy himself a microscope, and if he is diligent for three months he will be able to make the test. It is the simplest thing in the world. All he has to do is to cultivate his finger ends and use his eyes. Any man can recognize a Klebs-Loeffer bacillus under the microscope if he looks at it, and having once seen the disease and learned the smell he can no more get it out of his eye, for it is indelibly stamped upon him, then he can get the smell of the scourge of cancer from his nostrils.

I passed through an experience in my practice last year that I would not go through again for all the money I have earned in twenty-nine years' practice, and I have been an ordinarily busy man in a thickly populated city and in a thickly populated country. And if it is not taking too much time I would like to relate that experience for the benefit of the gentlemen present.

I have been the physician in our county children's home, and I had the misfortune, just a year ago, of passing through an epidemic of measles in that home, that was followed by a very virulent epidemic of diphtheria. A bacteriological examination was made and reported to me within twelve hours. The point I want to get at is this, that in thirty-three days after one of those boys had had diphtheria, and recovered, a bacteriological examination was made of his throat and it was found that he still had the Klebs-Loeffer bacilli in his throat, and, therefore, able to communicate the disease to others with whom he came in contact. Now, some one here has said that if you could get some of the secretion you could easily determine. It has been determined by bacteriological examinations that persons who are not sick at all may have the Klebs-Loeffer bacilli in their throats and communicate the disease. Now, there must be some reason for that; there must be some reason why a person having the bacilli does not get sick. However that may be, it is immaterial in this question, but it is a fact that where you have a family where there is a case of diphtheria where a bacteriological examination has been made, that each throat in that house should be examined bacteriologically every three or four days, and that each should be separated from the other; and if you find one case where your child is apparently perfectly well and it has the Klebs-Loeffer bacilli, the thing to do is to separate it, keep it away from the other children who hav'nt it, that they may keep healthy. A bacteriological bureau in the state of Ohio would save to the people of this state an immense amount of money and an immense amount of suffering and affliction to the families that are bereaved by the terrible scourge, diphtheria. We passed through an epidemic, and every four or five days the throats were examined, and where there was the least particle of suspicion a bacteriological examination was made, and when a Klebs-Loeffer bacillus was found that child was separated and put into a detention hospital. The very moment the throat became sore it was put into the hospital, and the result was that we passed through with sixty-seven children in that hospital, having twenty-one cases of diphtheria, three cases of laryngeal diphtheria without a single death. By reason of that early bacteriological examination, proving clearly, gentlemen of this assembly, that we had diphtheria, *and from the fact that we were able to take it by the throat immediately* we curbed and kept down this terrible scourge. Think of it, fifty-five

cases treated and of which bacteriological examinations were made, and not a single death; with about sixty-two treated during the same time with other examinations—without bacteriological examinations— and seven deaths. It was not the bacteriological examinations that prevented these children from dying, but it was the fact that this disease was taken in its infancy, caught before it got started; the blood was not poisoned, septiceamia had not taken place. The physician knew early what to do. Every physician who has practiced for five years, and has gone through an epidemic of diphtheria, knows he would give more for the first eighteen hours in diphtheria than for all the other hours that follow. I learned long ago that the way to have my patients get well is to keep them from getting sick, and if I can succeed in doing that I will have a reputation as a physician second to none. That is the thing you want to do with diphtheria. A bacteriological examination made early, or when it should be made, and proper treatment at the proper time, will prevent many deaths.

Dr. C. C. Fulton, Portsmouth: I wish to state some of our experience. I am health officer at Portsmouth, and we have had a good deal of trouble to know whether it was diphtheria or what it was, and in the month of November there were eight deaths that were said to be from croup, and our board of health did not think it was, but instead of being croup it was laryngeal diphtheria. We have now employed a bacteriologist, and have all the cases reported to the health officer, and if we have any doubt at all put it under the microscope and show it up at once; and since we have adopted that we have gradually got ahead of diphtheria in all its forms. Had one death in about 17 or 18 cases. There were five or six cases of reported croup, but the bacteriological examination showed clearly that it was diphtheria. We quarantined these houses just the same as diphtheria. I am heartily in favor of the bacteriological examination. Our board of health puts everything under the microscope that we have the least doubt about, and it is an easy process.

Dr. P. H. Aldrich, Defiance: I have been very much interested in the discussion of bacteriological examination for diphtheria. I am a strong believer in strict quarantine of all sore throat, and that is what we do at Defiance. We isolate the cases wherever we can, and disinfect the premises. Not only the premises where the diphtheria exists, but along in the fall when the school commences we continue until spring. During the summer we hardly ever have a contagious disease; it is only at a time when the children are congregated together at one place. Now, as soon as we find a case of sore throat in the school, the teacher immediately sends the child home to await results. We ask no questions, but immediately

that night disinfect the premises and thoroughly fumigate the school room, and not only the one room but the whole school house. We do that during the whole winter, and we have, to a certain extent, overcome diphtheria. Of course, bacteriological examination is a good thing, but I am afraid in some instances it would be too long before we would get an investigation made and could tell whether it was diphtheria or not. So I think about the best thing we can do, and what ought to be done, is to treat every case of sore throat, however bad, or if it is not bad, as an infectious disease that may lead into diphtheria, because Dr. Ebright, of Akron, has told us that this Klebs-Loeffer bacillus is found in throats where there is no disease, and it is spread in some way or other. How is it spread? We do not know, except by contagion. Now, where there is a child that is physically and constitutionally well, you can put that child beside a case of diphtheria and it would not take the disease at all; but you take a child that is run down by disease, or that is lower in its state of existence, that child will take it at once. Consequently isolate the child. Keep all the children away, and thoroughly disinfect and fumigate any place where there is any possibility of a disease of a contagious nature or character originating.

Professor Nelson: I rarely differ from my friend Dr. Probst, and he has lived with this subject all the while but I hope that you will not rely upon the State Board of Health to get a bacteriological laboratory for the state unless it be simply for study and investigation. These laboratories ought to be in every town and village. Dr. Hopkins has said that the first hour is worth more than the next twenty-four, and as the gentleman from McConnelsville put it, it takes three days, if not four, to send the matter to Columbus, where the laboratory would probably be located, and return. I want simply to call your attention to this thing, as stated by my friend Dr. Ebright: Any doctor can settle this thing if he is willing to go to the trouble. But I want to caution you against thinking you can settle it by the purchase of some of these cheap microscopes on the market. I should be very much afraid that you would do more harm than good, but if you are willing to pay a good figure for accurate lenses there is no question but that you can learn to make these investigations for yourself. So it is not necessary to have a special bacteriologist in every town or village, because every doctor can become one. I differ from Dr. Ebright who said it is easy to to tell these bacilli from all others. I think you cannot smell it as you can cancer nor tell it from thousands of others after having seen it once, but I do believe that there is a series of examinations that enable you to settle the question with absolute accuracy. So that a doctor who has a microscope with accurate lenses, that will not distort the figure at all, after a little while will learn to recognize these

bacilli from everything else and diagnose his own case in thirty minutes unless he wants to wait for the development of the culture. And I believe that that is the solution of this important question that these doctors who have these cases must prepare themselves for this work. I am constrained to say that in my experience physicians of this state do not have microscopes of sufficient accuracy to be of any value. I think I may say there is not one in the town of Delaware that is prepared for this work, although a number of them have microscopes that were bought years ago, a cheaper instrument that was put on the market in those days. It is probable that $100 judiciously expended would enable you to have an outfit, and of course an outfit, if taken care of, would last a great many years. Settle these questions in your own office in all cases, and then, as Dr. Hopkins has said, you ought to have antitoxine ready, and the moment you find a case, apply it, no matter what the cost.

There is another question that has been hinted at here that cannot be settled accurately, and that is how long the contagion is going to last in the body. There is no question but what you can find bacillus before the membrane is formed, and there is no question but that you can find the bacillus in the throat after the membrane disappears. I believe the Ashtabula doctor quarantined in his case until he failed to find the bacillus in the throat. The question is, how long does that continue? You cannot let the patient out in ten days or fifteen or twenty days, but after the bacilli disappear. Dr. Shaeffer, the great bacteriologist of London, reported that he found a bacillus in the throat nine months after the disappearance of the disease. The only criticism that has been offered, for nobody questions the accuracy of his statement, is that perhaps, that might possibly have been a fresh invasion, because he did not examine the patient day after day during the nine months, but he knew it was a very malignant case and nine months after that he found the bacillus in the throat.

A Member: As we have two other papers on the program I doubt whether we will have time to consider and discuss them unless we close the discussion on this paper.

President Wise: The discussion has been very interesting, but the time has arrived when it will have to be brought to a close. We will now listen to the reading of a paper by Dr. F. T. Miles, Health Officer, Salem, upon the subject: "Should Measles or Whooping Cough be Quarantined?"

Dr. Hoover, Columbus: I would like to make a suggestion before the doctor begins to read the paper. In the afternoon program the last item is a discussion of questions to be propounded. I have been informed by several of the members of this meeting that they are going home soon

after dinner to get home before night, and I would like to give the time that is allotted to me this morning to the answering of such questions as may be suggested by the members of the convention. I believe it would be of more benefit. A great many of the members of the convention come here with a special object in view, to gain information upon a certain point and I believe that the thing to do is to give them an opportunity. Many of them have been here since yesterday morning and will want to go home immediately after dinner. I therefore move you, Mr. President, that the order of the program be changed and that the last topic of the afternoon to-day, the discussion of questions not on the program, be transferred to the last topic this morning.

Motion carried unanimously.

Dr. Miles: I desire to state in way of explanation that my paper is exceedingly short—first, because I believe that more interest can be brought out by a general discussion of this subject than by a lengthy paper and, last, but not least, because of the little I had to say on the subject.

SHOULD MEASLES OR WHOOPING COUGH BE QUARANTINED?

By Dr. F. T. Miles, Health Officer, Salem, Ohio.

Mr. President and Gentlemen: In preparing a paper upon this subject I did not hope to be able to present anything new, but simply to call your attention to what you already know, and ask you to apply it, along the line of thought suggested by the subject. History tells us that measles made its appearance in America shortly after the arrival of the first settlers, and advanced steadily with the pioneers of civilization, and that at present its distribution is almost world-wide, only the remotest corners of the earth are exempt from its ravages.

Whooping cough evidently made its appearance soon after measles. We have records of its appearance in London in 1678, under the name of chincough. Throughout the eighteenth century, whooping cough rapidly increased, and became widely diffused as numerous descriptions of epidemic attest. During the present century, whooping cough not only occurs epidemically throughout America, but in almost all towns and cities, as well as in the country. It has become epidemic, so that cases are almost constantly occuring.

Measles and whooping cough are classed with the diseases of childhood, and while not wholly confined to children, they are essentially diseases of childhood, and, indeed, seem to be of less severity during that period than later in life. Both are contagious diseases, measles intensely so, and even during the prodermal stage when accurate diagnosis is often impossible. In uncomplicated cases, death rarely occurs from these diseases; yet in complicated cases, death does occur; and while they may not be the immediate cause of death, they are indirectly responsible for it. The number of deaths in proportion to the number of cases reported is so small that we are apt to take but passing notice of them, and one would not have to be led far astray to almost imagine that they were essential factors in the make-up of every individual. Indeed, I have a letter from a very successful and promising physician, in which he states that he believes measles and whooping cough to be necessary diseases of childhood, and that if he were the father of a family, he would make it a point to expose his children to these diseases.

We cannot think that they are necessary diseases any more than are our other zymotic maladies. They are not wholly unavoidable, it is true, but let us style them accidents of childhood and not necessities, unless we wish to include all diseases to which human flesh is heir as necessary to our well-being, even though they cause much discomfort, and many, many deaths. I am inclined to think the doctor wrote hurriedly, and did not choose words to express his meaning. Many of the laity do expose their children, thinking, no doubt, the sooner they are over them the better, and the sooner they die, if they must die, the better; and if the latter were true we could not but agree with them; but the diseases are unnecessary and the deaths from the diseases are also unnecessary. Yet, both to a certain extent, are unavoidable.

Professor Atkinson, of the University of Maryland, in speaking of measles, says: "Unfortunate results so often follow it, however, that no one is not justified in placing unprotected persons beyond its influence." And we cannot imagine of one father here to-day who would be so inhuman as to purposely expose his child to whooping cough. But the important question in this subject is to what extent is the mortality in these diseases. Is it sufficiently great to call for quarantine restrictions, and is the quarantining of such cases practicable? I believe if a vote were taken in this meeting the greater number would vote against using such a strict measure, or even against using any at all. But from the reports of the State Board of Health of 1893 and 1894 (all the statistics at my command), I have gathered proof that is conclusive to me, and hope that it will serve to at least stimulate an investigation with you.

I have taken the four common zymotic diseases for comparison, namely: diphtheria, scarlet fever, whooping cough, measles. It was not my good fortune to secure the number of cases reported from these diseases, which I regret very much. During the year 1893, there were in Ohio 5,240 deaths from zymotic diseases; 1,129 of these, or over 21 per cent., were from diphtheria; 212, or over 4 per cent., were from scarlet fever; 126, or over 2 per cent., were from whooping cough; and 96, or less than 2 per cent., were from measles; and taking measles and whooping cough combined, 222, or over 4 per cent. of all deaths from zymotic diseases. In 1894 there were 5,447 deaths from zymotic diseases; 933 of these, or over 17 per cent., were from diphtheria; 543, or over 9 per cent, were from scarlet fever; 272, a little less than 5 per cent., were from whooping cough; 217, or a little less than 4 per cent., were from measles; and from measles and whooping cough combined, 489, or less than 9 per cent. of all deaths from zymotic diseases. By arranging these figures so we can more readily comprehend them, we had, in 1893, about one-fifth as many deaths from measles and whooping cough as we had from diphtheria, and one more than we had from scarlet fever. In 1894, more than one-half as many died from measles and whooping cough as died from diphtheria, and almost as many as died from scarlet fever. It would be interesting to know how many of these deaths from measles and whooping cough were of children and how many were adults, but I know of no way of procuring such. It is sufficient, however, for our purpose, to know the number of deaths. It would appear to me the statistics that have just been presented would sufficiently answer the first part of the question. That the mortality is sufficiently great to justify quarantine of the patient, but it is easier said than done.

The quarantine of persons afflicted with these diseases is an intricate matter. The duration of measles is not long, but as has been before stated, they are intensely contagious. Even before a diagnosis can be made, and in whooping cough, where weeks and even months elapse before the patient recovers, it becomes a serious matter. In the article by Professor Atkinson, before referred to, he says: "A person with measles should be separated from those who are unprotected, in a room into which only the attendants should be allowed to enter, and communication with the rest of the household should be as restricted as possible. All soiled linen should be soaked in disinfecting watery solutions, and boiled separately. Recent investigations make it very doubtful whether the disease can be communicated during desquamation. Some writers claim that a month should elapse before the patient be permitted to mingle with unpro-

tected persons, and others claim quarantine is not necessary after the eleventh day of the disease. A hot bath administered at this time will remove all desquamative epidermis, and along with it the contagious principal. Again, allow me to quote paragraphs from the writings of as eminent a man as Charles W. Townsend, who says that "isolation of the patient is the only means we have to prevent the spread of whooping cough; and if possible the patient should live and sleep in a room away from the other children; and mother, or nurse should, if possible, change or air their clothes and wash their hands before leaving the patient to go to the other children; and thorough disinfection should always be practiced after death or recovery."

Since it is not asked by the subject assigned me how this restriction shall be carried out, I shall leave that for those who are better able to say, and I have quoted from the above authors simply to show that good authority considered it advisable.

I realize that until the public generally could be sufficiently educated to see the necessity of such a procedure we would meet with much difficulty and serious objections. Yet I believe that we, as health officers and members of boards of health, should do all that is possible to prevent the spread of these diseases.

President Wise: Gentlemen, you have heard this interesting paper. We are now ready for discussion.

Dr. Unkefer, Piqua: Piqua is a city of about 12 000 inhabitants, and I have been health officer there for a short time. In that time I do not think there has been a winter but what there has been measles and whooping cough. I think that it is impossible to quarantine measles, or to find out the number of cases in a city. There are not half of them that employ physicians, and therefore, it would be impossible to tell where the whooping cough and measles were. I went around to visit our schools when I took my position as health officer, and I said to the teacher in every case: "Report to me immediately any contagious disease, sore throat or anything of that kind. I would rather make a mistake on the wrong side than make a mistake that would be detrimental to the school." I said to the teachers to send the pupils home and not allow them to come back until they saw me, and we have never had a particle of trouble and I have had a great many cases since I have been health officer. We have always had measles and whooping cough, but it has been no detriment to the schools. You can see no change in the school whatever in the seven years that I have been there. There have been a great many cases since I have been there, but there have been so few that stayed out that there is no material difference. I go to that home immediately and do not allow them to come back until they hear from me, and in that way I think it keeps it from spreading. It is an impossibility to guard against the spreading of whooping cough or measles. They go days and days before I can find them. They will go to school and the teacher will say to me: "Here comes a child that has been coughing for several days; I am not positive whether it is whooping cough or not." I send it right home and let the family physician say whether it is whooping cough or not. The first health officer told me there was a good deal of trouble be-

cause the people were not educated to it. Now they are becoming educated to it and they know it is a benefit to their families, and to everybody to be careful. If we had some means to make these people report the cases it would be a different thing. There are hundreds of cases that will never have a physician at all.

I. A. Oldham, Cambridge: My experience with measles has been that we should quarantine the house. We notified the superintendent of schools that if measles existed we required that the child remain away from school. I have no trouble in finding out these cases. The truant officer looks after the measles and anything else in the way of disease and reports them. We believe it is a disease to be quarantined. If there is no doctor there when I get there I call a doctor and then placard the house and enforce it just as rigidly as any other quarantine.

Dr. True, McConnelsville: I believe it was two years ago that the State Board of Health ordered the compulsory vaccination of the children of the state attending the public schools, and before they were near all vaccinated that order was suspended because there were whooping cough and measles and different diseases of childhood epidemic in certain places in the state. I was a little surprised. It seemed to me that it ought to have been hurried up in order to stop these diseases.

I want to give my experience in preventing whooping cough. The only preventive that I know for whooping cough is vaccination. If you will vaccinate a child just as he is taking the whooping cough, as soon as the vaccination takes the whooping cough subsides. A good many times children have been vaccinated and some time after the vaccination they will have the whooping cough, but you can prevent it if you will vaccinate a child and get it to take when he has never been vaccinated.

In reference to scarlet fever I have been through six different epidemics of scarlet fever in Morgan county, and I have observed things pretty closely, and I have the first death from scarlet fever to see in a child that had been vaccinated and the vaccination had taken. What I claim is that vaccination produces a change in the system of a child and makes that system something like that of a grown person's. Now, you know grown people are not liable to take scarlet fever. I do not think I ever saw a case of scarlet fever in a grown person, and after the vaccination of a child I think it is, in a measure, protected the same as grown people are. I do not know that it has any protective influence against diphtheria. I have mentioned only what I have observed. I would like to hear from others as to what they have observed in regard to these things.

I. W. Clayton, Bowling Green: This gentleman says that he has never seen an adult who had scarlet fever. I want to call your attention to a lady in Bowling Green, our town, who had the scarlet fever.

A Member: I call the gentlemen to order: We are not discussing scarlet fever. We are discussing the advisability of quarantining whooping cough and measles.

Dr. Jenkins, Plain City: We are, as health officers and members of boards of health, entrusted with the health of the community. It is our duty so far as possible, to prevent the introduction of contagious diseases, and having been introduced, it is our duty to confine them. Now, we know that measles and whooping cough are not necessarily fatal, but it is, by reason of the complications that arise and the sequella, that prove fatal. Now, if death from these diseases occur occasionally we must necessarily conclude that the more cases there are, the more deaths there will be, and as it is our duty to prevent the development of these diseases, I believe it is our duty to quarantine against them, and also to quarantine against diphtheria and scarlet fever, and we are to see that children are not exposed to these diseases, because, while they may not die directly from the sequellæ, it may make invalids of them for life.

J. L. Johnson, Health Officer, Sabina: We have had measles in Sabina, and we quarantine that as well as scarlet fever and diphtheria, and we have never had a case appear out of the house where it originated.

Dr. Stanton: As the word quarantine has been used here it is almost synonymus with isolation. I think there is a difference in these two cases. I believe in thorough isolation of patients in cases of whooping cough, but I do not believe that we should quarantine the families in case of either of these diseases as should be done in the case of the more dangerous epidemics of the contagious diseases. I believe that any child with the whooping cough ought to be isolated, but I do not believe, however, that it is necessary to restrain other members of the family. I think other children of the same family should be permitted to go to school. I do not believe there is a poison that can be carried by the second person. The disease is transmissible only from the person who has it. There is one difficulty in regard to the isolation of these cases of whooping cough and that is of diagnosis in the early stage. There is nothing peculiar about the disease, nothing positively diagnostic about this disease till the whoop can be heard, but the disease can be transmitted before that stage is reached. I believe it can be transmitted for a number of days before the whoop can be heard. So that the difficulty in the case of whooping cough rises from the difficulty and impossibility to diagnose in the early stage of the disease.

Now a word in regard to quarantining whooping cough. It is a thing of such long duration that it would be an injustice to enforce this quarantine in the case of whooping cough. It lasts not only for weeks, but in some cases for months. Among the Japanese it is known as the

"hundred day disease," and it is considered as a short course of the disease when the patient recovers in six weeks, and it would be an injustice to many patients and families to enforce a quarantine. It would be an injustice to many of those patients to require them to stay in the house for the length of time that this disease frequently covers.

Another word in regard to whooping cough. I believe that the danger of this disease is underestimated in young children. I do not believe that it very often occurs that persons die from whooping cough after infancy, but whooping cough should be regarded as one of the diseases to be most dreaded in early life.

Now, in regard to measles, I do not agree with those who believe that measles is a trifling affection, one that ought to be transmitted to children; that children ought to be exposed to it because they have the disease so mildly. Statistics show that measles destroy almost as many persons as scarlet fever. Indeed, in some sections of this country the disease is to be more dreaded than scarlet fever. Statistics show that in the northwest measles have destroyed more children than scarlet fever. It is probably not true in our own climate, but it may be true in the northern part of Illinois and Indiana, the state of Michigan, Minnesota, Wisconsin and Iowa. If we had full mortality returns we would find that the deaths from measles would quite equal the deaths from scarlet fever. So this is not a trifling affection as commonly regarded, and. therefore, I think that children with these diseases ought to be isolated. I do not, however, believe that it is necessary to quarantine a family or that it is necessary to keep the children of the house away from school as long as should be done in many of the other diseases.

Question: Would you placard the house?

Answer: I would placard the house in case of measles or whooping-cough; not because I would enforce rigid quarantine, but in order that those who had children that were susceptible to this disease might be notified of the existence of it in the house. I would quarantine all contagious diseases, but in these cases I would isolate. I would not enforce rigid quarantine regulations as I would in other contagious diseases.

Question: I would like to ask the member if he would consider it just as important to fumigate for these diseases as he would in any other case?

Answer: I would in case of measles. I would not think it necessary in case of whooping cough.

Dr. Heffner, Bellefontaine: The subject is, should measles or whooping be quarantined? I would say, yes. And why? Simply because it produces death. Second, because it wastes the time of other children. They become exposed to it unnecessarily. Whooping cough and measles

can only be controlled by quarantine. They may be innocent in themselves or they may be dangerous in themselves, but no matter. The only way you can control them is to keep children away from them. They will nearly all take whooping cough and measles if exposed to them. Keep them out of school. All children, in my judgment, should not be permitted to go to school who have not had measles, that is, from a house where the children have measles, and I don't care how much they are isolated either, because of the untrustworthiness of the parents as a rule. We cannot depend on them. They will say their children have not been exposed but they have, as time will prove, and if they come to school they will destroy one room so far as school is concerned. Therefore quarantine each and every house in which there is measles or whooping cough.

A Member: May we not have the remaining part of the program, the discussion of questions which are not on the program? I think there are many here who would like to have this brought forward at this time.

Dr. D. S. Cossitt, Conneaut: I want to call your attention to what I consider an omission in the state laws on contagious diseases. You will find in section No. 5 of the state law that whooping cough and typhoid fever are omitted in the list to be placarded, and I think in the case of both of these diseases the house ought to be placarded and the patients isolated.

President Wise: Gentlemen, we will now close the discussion on this subject, and proceed to the general discussion. I will now give an opportunity to introduce a few resolutions that are to be offered.

Dr. Albert S. Rudy, Lima: I have a matter which I wish to present. It is not just exactly a question, and yet it is a question. We can receive a great deal of benefit and help from the members of the board, and we have had some difficulty over at Lima. We had an epidemic of smallpox last year, and we had no pest house to take the patients to, and we had to manufacture one. Now, I want to present a resolution empowering boards of health to manipulate the funds belonging to the board of health. We think that the members of the boards of health are generally as competent to manipulate and handle the funds as the city council or the township trustees. I will read the resolution:

Resolved, That it be the unanimous voice of this convention that the local boards of health be authorized to make levies and have control of the disbursement of said funds independent of the city council or township trustees.

Resolved, That we respectfully ask the members of the Seventy-second General Assembly to use all honorable means to secure the passage of such a law.

Dr. Phillips: I shall most decidedly favor that move, for the simple reason that in our own city we have had a great deal of trouble with our

council. I believe that above all other classes of men, the boards of health, composed in part of physicians, can make better use of this money than the council as boards of health are out of politics, and I believe we should have a right to issue orders, draw upon the treasurer, without any reference to the council.

Resolution adopted.

Dr. Daugherty, Bucyrus: I want to call attention to a matter that I think this board should take action on; it is the cigarette bill to be brought up next Monday. One of the senators lives in our town, and he states that there is considerable opposition to the bill. I desire to offer this resolution:

Resolved, That we, the members of the State and local boards of health of Ohio assembled here in Columbus, and knowing the evil effects resulting from the sale of cigarettes, do heartily recommend the passage of the Avery bill.

Dr. C. A. Offenbacher, Saint Paris: If I can get a second I would like to amend that and ask the legislature to make it a fine of $500 and six months imprisonment.

Resolution adopted.

Mr. Robinson, Ashtabula: There is a question I wish to bring before the meeting, a little out of the line of the questions we have been discussing, *ie.*, sanitary policemen. We have had some trouble in properly clearing up garbage and rubbish in the township and in the small towns. I see by the looks of some of the streets as I go into some of the larger cities, that they get into the same trouble, or at least they do not get rid of the dirt. We have an ordinance against throwing rubbish into the streets, but the trouble is to catch the man. We have a good ordinance, and I had one drawn to make it the duty of the property owners or the occupants of premises to clean the streets in front of their premises of certain things, and I asked our city solicitor (he drew the ordinance), if it was legal or constitutional. He said he had his doubts about it, and I asked him afterwards if it was passed by the legislature as a general law if it would be legal, and he said he had no doubt about its being legal, or about an ordinance passed under it, if it became a general law. I brought it down here to ask our representative to introduce it into the legislature, and he told me it would help it a great deal if we could get the endorsement of this meeting, and I brought it over here and I want to read it to you, and if you believe it will help us, I would like to have it endorsed.

Be it enacted by the General Assembly of the State of Ohio, That it shall be the duty of the owner, occupant or agent of any owner, on any lot, building or premises facing or abutting on any street, lane or alley, to keep such street, lane or alley clean and free from rubbish, ashes, shavings, paper, offal, straw, wood, earth, manure or refuse matter of any kind whatsoever, and to keep the gutter in front of said lot, building or premises

free and clean from all obstructions which will in any way retard or prevent the free flow of water therein.

Sec. 2. Any owner, occupant, or agent of any owner of any lot, building or premises, who shall neglect or refuse to remove any of the substances mentioned in the foregoing section for the period of twenty-four hours after being ordered to do so by the sanitary police officers of any city, village or township, or any township trustee or road supervisor or street commissioner, shall be deemed guilty of a misdemeanor, and shall be fined in any sum not exceeding twenty-five dollars, and pay the cost of prosecution, and in default of the payment of said fine and costs, be sentenced to labor upon the streets until said fine and costs are paid.

Now, in discussing the question of sewers and the building of them, the question came up: How are you going to do it? I do not see how you are going to clean the streets unless you make each one clean his own. It is cheaper for any man who is not doing a large business which takes all his time, to clean the street in front of his own property. A man working ten hours a day can keep his street clean very easily at a very light expense. I occupied a farm at one time that had 260 rods of road and I kept the gutter clean in front of that property. It only took me about a half a day in a year.

Mr. Miller, Akron: If this bill is adopted as read, it would provide and require that when I bought property I should keep the street clean regardless of how these substances may have got there. They may have washed there by the rains, and it would work an injury to a great many innocent parties. I should vigorously oppose such a bill.

George Flammer: I want to ask the officers of the State Board of Health whether it is necessary to quarantine in case of mumps. We have a case of that kind in our township.

A Member: I rise to a point of order. There is an ordinance before this body, with the request that we approve or disapprove it.

And thereupon, on motion, the resolution was rejected by a large vote.

A Member: Some one has inquired about mumps. We have a case of mumps in our township; four members of the household attend the district school and the teacher wanted to close the school, but the trustees said he had better not until he heard from the health officer. I want to know if it is necessary to quarantine the family and keep them at home while that one member of the family has the mumps?

A Member: The State Board of Health requires that the mumps should be quarantined.

A Delegate: I see by the program that we are to meet at 2 P. M., Standard. Can't we meet a half hour earlier than that? I move that we meet at 1:30, Standard, instead of 2 o'clock.

Motion carried.

Dr. A. S. Rudy, Lima: The Mosgrove bill has passed the house and will be before the senate soon, and I believe it is the duty of every physician here, for the good of himself and the good of the people, to make a special call upon a senator, and especially those who are opposing it (and I will give you the name of one, T. J. Harbaugh), and impress upon them the importance of passing the bill. I therefore move that we, as a body of physicians and health officers and members of boards of health, approve that bill.

Dr. C. W. Heffner, Bellefontaine: It perhaps would be well to find out whether all are in favor of that bill or not. There are some features about the bill that are certainly objectionable.

Motion carried.

Dr. C. H. Quayle, Madison: I would like to ask a few minutes discussion upon the best plan of disposing of night-soil and garbage in small towns of from 500 to 800 inhabitants where we have no sewerage.

Dr. Unkefer: I could not answer that question, but I am glad that Dr. Quayle brought that question up. He came here for information, and he has just as good a right to have that information as anybody else, and it is our duty to give him information. I think we ought to devote five or ten minutes to that topic. It would be of great benefit to him.

Mr. Flammer: I can tell you how we do in a town of 1,500 to 1,800; the vault cleaners haul it off to the farms and it is plowed under.

Dr. Frazer: In our town the past year we have had a good deal of trouble to clean the gutters, and I found a dump-hole within a mile or such a matter of town that wasn't used and I persuaded the property owners to haul all their dirt accumulation there, and also the street commissioner to see that streets were cleaned and the debris carried to that point. Before that it was just hauled into some back alley and became a nuisance there.

Dr Waltz, Collinwood: I will give you an idea of how we dispose of our night-soil in a town of about three thousand inhabitants. We have an ordinance that property owners are obliged to have their outhouses cleaned three times a year—April, July and October. The sanitary policeman, when these times come, serves notices compelling them to pay in advance. We have a night-soil contractor who receives his contracts by bids—so much for cleaning boxes, so much for no boxes, and so much for vaults at so much a foot. This contractor finds a place that complies with the state law, and it is approved by the board of health and then he goes to work. Now, the charges are forty cents per box, sixty cents for no boxes, and something like $2.50 a foot for vaults. This work is done by the contractor and he is paid at the time the cleaning is done, if the property owners choose to, but if they do not it is put upon

the tax duplicate and assessed in that way. We have no difficulty in making this plan work.

A Member: In our town of about 8,000 inhabitants we dispose of the night-soil by a scavenger. The night-soil man removes it at the expense of the property owners. He is notified by the health officer or by the policeman to have his vault cleaned. The soil is taken out at night during the summer months and conveyed outside of the corporation and deposited in trenches two or three feet deep. On the complaint of any citizen, or upon any information of any nuisance of that kind we require it to be abated in two days. We find the plan works well, but in a town the size of ours that is not sufficient, for it requires a good deal of diligence on the part of the sanitary policeman to make a perfect inspection of these privies.

Dr. W. E. Linden: We, at Cleveland (we call Brooklyn, Cleveland), are looking forward with a good deal of expectation to a process that is being experimented with there for the destruction of garbage and night-soil. This process is something on the plan of a crematory that burns it up, at a much less cost, and this process will be applicable to small towns as well as to large cities.

Mr. Kinney: I wish to say to this board and to our worthy secretary, that the health business is a new thing in the townships, and while these discussions have been interesting to me, yet they are things that do not reach our case. I wish to know, in the case of scarlet fever, how long it will be before it is safe to finally clean up, disinfect and let the people out. I will say right here that we have opposition to the whole sanitary law in our midst, and we are fighting a battle. I left two cases of scarlet fever at home, one a child nine years old, carrying 101 to 104 fever, and may be dead before I get back. The other case is in a house where they were put at the public expense. Now, I will have to disinfect when I go home.

Dr. Probst: You will find the answer to your question in the rules of the State Board of Health. In scarlet fever there shall be isolation of the patient and quarantine of children associated with or in the house with the patient for ten days after complete desquamation or scaling of patients and disinfection of the premises.

Mr. Kinney: If the board of health of a township are not satisfied with the way a house has been disinfected, can they compel a thorough disinfection after a physician has declared all danger over?

Dr. Probst: Undoubtedly, sir. There is no question about that.

Mr. Kinney: Can an upholstered lounge be disinfected so that all danger of infection is passed if used by a scarlet fever patient as a bed?

Dr. Probst: I should say not. I should say that in such a case it should be destroyed if it had been used as a bed?

Mr. Kinney: A case of fever in one house; the son's house within one hundred yards or less; the two families intermingling. Would you quarantine both houses?

Dr. Probst: You will have to treat them as one unless you can keep them apart.

Mr. Kinney: Has a board of health the right to exclude a certain class, say ten years of age and under, from attending any of the public assemblies during the prevalence of scarlet fever in their township?

Dr. Probst: I doubt very much whether the board would have authority to enforce such a rule, ten years and under. The law provides that the board of health may enforce such rules and regulations as it may deem necessary, but the courts have always held that these must be reasonable rules.

A Member: Has a board of health, except in cases of disease, any jurisdiction over the matter as to who shall attend the public schools?

Dr. Probst: I think they would have no right to prohibit anyone from going to school who had not a disease, or perhaps who has not been exposed to a disease.

A Member: Can our township boards appoint a sanitary officer?

Dr. Probst: Yes, sir. The township board may appoint a health officer and as many sanitary officers as they deem necessary.

Mr. Bennett, Geneva, presented a resolution to the convention providing for the enactment of a law by the legislature which would enable persons to transport the bodies of human beings that had died from contagious diseases into other states for burial.

Dr. Probst stated that this question had been considered by the State Board of Health, and that it was disposed of by ordering the secretary to bring it before the national conference of state boards of health, an organization embracing all the state boards of health in the United States, for the purpose of endeavoring to secure some uniform rule and regulation for the transportation of dead bodies. That association will meet within the next few months, and the matter will probably be brought up at that time.

Mr. Reed: It seems to me, from the information that has been given us in regard to the previous action of this board upon that question and the reference of the matter to the national board of health, that this supercedes all necessity of any action by this body, as the matter is already upon its way to final settlement. I therefore move that this resolution be laid upon the table.

Motion prevailed. And thereupon the convention adjourned till 1:30 P. M.

AFTERNOON SESSION.

FRIDAY, *January* 31, 1896.

The convention was called to order at 1:30 P. M., by President Wise.

Dr. C. H. Quayle, Madison: Owing to the fact that a great many of us have to leave on the early evening train, and owing to the fact that we all feel the necessity of hearing from our secretary in reference to the duties of boards of health—some of the members have been sent here with that one object in view—I move to suspend the rules of order and that we hear from our secretary first on the program.

Motion carried.

Dr. Probst: I purposely placed myself at the bottom of the list hoping that the proceedings would take such a turn that it would be unnecessary for me to read my paper, but you seem to have circumvented me.

THE DUTIES OF A BOARD OF HEALTH.

C. O. PROBST, M. D., Secretary State Board of Health, Columbus.

At the last annual meeting of boards of health, the duties of a health officer were presented by Dr. Kahle. I fear it is the case in many places, that the health officer is required or expected to perform the duties of the board of health, as well as his own. Such is certainly not the intention of the law under which boards of health are appointed, and it may consequently be well to point out some of the duties of boards of health, and of their individual members.

Men gather together in communities for mutual protection. In early days this was mainly needed against savages and wild beasts and all took turns in guarding the camp.

While congregations in cities and villages gave us protection against external enemies, it created new dangers within, which are perhaps more inimical to life. It has been shown that the death rate increases in almost direct proportion to increase in density of population, and communities must keep up a constant warefare to protect themselves against disease. The individual is powerless to protect himself. He may build his dwelling after the best known laws of sanitary science; may guard himself against a bad sewerage system by proper plumbing, and against a polluted water supply by household filtration; but he cannot protect himself against multitudinous sources of injury from careless, indifferent or vicious neighbors or townsmen. He may be exposed in many ways to contagious disease—in the schools and churches, on the streets, even in his own home, by visitors. His milk supply may come from tuberculous cows, or may contain the germs of typhoid fever. His food may be poisonously adulterated. In traveling he is exposed, at hotels and other stopping places, to dangers his foresight may have removed from his own home. Even at a health resort, as happened to many last year in our own state, he may find typhoid fever in his cup of water. An individual would have to live a life of almost complete isolation and give his whole attention to the

matter, to protect himself against these and other dangers, and the state has therefore wisely provided for a board of health in each city, village and township, and clothed it with almost unlimited powers to shield us against causes of sickness and death. Surely no more precious interests could be placed in the hands of any body of men, and boards of health are the sentinels to-day upon whose faithful discharge of duty depends the safety of those within the camp. But our foes now may lie lurking in every household, in a hundred different and often in unseen ways they may attack us, and our guards must know where to find them as well as how to destroy them.

The duties of a board of health are manifold. In the first place the board should be properly organized. The legislature has enacted many laws for the protection of the public health, which apply to the people of all the state, and which boards of health are expected to enforce; but it has also authorized boards of health to adopt and enforce additional orders or laws specially adapted to the needs of each community. The adoption of comprehensive rules and regulations for the prevention and restriction of disease should be the beginning of a board's work, and these should be amended and added to from time to time as experience dictates and changes of conditions require. No rule or order should be adopted which it is not expected to enforce. Rules of too great stringency in the beginning often defeat themselves, and hence rules applicable to a community which has for many years maintained an active board of health may be entirely unsuitable for a community where there have been practically no restrictions in sanitary matters. Let the more essential rules be adopted first; those which the intelligent part if not the majority of the community will approve of, and have these strictly enforced. Gradually these may be extended, but it will be the work of many years to put in full force all the health regulations that should govern a community.

And here I would suggest that rules for the prevention of the two dangerous contagious diseases, diphtheria and scarlet fever, cannot be too strictly enforced from the beginning, as there is no community in which public sentiment and the courts will not sustain the board of health in enforcing every necessary measure for their prevention.

While the health officer is properly the executive officer of the board, the enforcement of its regulations should not be left wholly to him. It is much better when this cannot be done without legal proceedings, except in cases of great emergency, that the matter be reported to the board, and that the board should direct that prosecution should be commenced against the offender. This robs the act of a personal character, and relieves the health officer of a responsibility that properly belongs to the board. Too frequently members of the boards of health shirk their responsibilities for fear of offending a neighbor who can injure them in the pocket, but if the board as a board will impartially enforce all its rules, difficulties of this kind will soon disappear. But little will be accomplished by boards of health without regular and frequent meetings. The law requires municipal health boards to meet monthly, and one of our best boards meets weekly. Some boards meet but once or twice a year, and sanitary matters in such places are usually at a very low ebb.

The law provides that township boards shall meet once a year, and at such other times as they deem necessary. It is surely "necessary" that these boards should meet at least quarterly, and provision should be made for such meetings.

If boards of health will adopt a regular order of business and if the members will all meet promptly at the appointed time and confine themselves to the business to come before them, an hour's time once a month will usually suffice to discharge all the business of a board of health. Conscientious members, however, will find other duties *ad interim*.

The members of the board should inform themselves of the sanitary condition of their community. This information may be gained by requiring the officers or employes of the board, or by appointing committees of the board from time to time to investigate and report upon special sanitary features of the place. There should be a

report upon the public water supply and sewerage system, if such public works exist, and an effort be made to bring about any needed improvements in either which would tend to improve the public health. The condition of dairies that furnish milk, and of slaughter-houses that furnish meat, should be known, and such places should be properly regulated. School houses should be examined (the law requires their inspection semi-annually) and all other public buildings. Once a year the board should cause a house to house inspection to be made. The law authorizes the board to employ as many sanitary inspectors for this work as may be necessary. The first time this inspection is made a great deal of work should be done, which need not be repeated; such as making a record of the location and construction of privy vaults, their distance from nearest wells, the existence of stables, hen houses, pig-pens and other sanitary, or rather unsanitary features of a more or less prominent character. The following years it may be only necessary to inspect houses reported as having sanitary defects.

When a contagious disease appears and spreads, an investigation should be made, which may show wherein rules which the board is endeavoring to enforce for its restriction are defective, or are being violated. All reports of this kind should be matters of record, for the board is changing in membership from year to year, and new members should be able to learn what the board has been doing and what will be expected of them.

Gradually but surely the board should bring about improvements in sanitary conditions, shown necessary by these investigations, or in other ways, commencing with those which endanger the health or annoy the greatest number of people. Hog-pens should be abolished; alleys, streets and yards kept free from accumulations of garbage and manure; vaults should be kept clean, and a rule should be adopted and enforced requiring a permit to locate and construct a vault, and only water-tight vaults or dry boxes should be permitted.

Some means must be provided for removing and disposing of garbage and night-soil. This work must be regulated so as to be done in a methodical, cleanly and thorough manner. Some study will be required in selecting the method best suited for the community.

Members of the board should seek to gain as much knowledge of sanitary matters as possible. It is surprising how much of interest there is in such subjects, and a taste is soon developed for information of this kind. Members should also be familiar with the health laws of the state. A little study will soon enable one to comprehend their essential features, and enlarge his understanding of the powers and duties of a board of health.

As the work progresses its scope will enlarge. The board will interest itself in securing the introduction of a public water supply, if none exists, as the community grows and the wells become unfit for use. Sewerage will naturally follow; and the question of disposing of the sewage will be for the board's study. The plumbing of houses is a matter of great importance as regards the health of the inmates, and the board will need to make provision for the inspection and testing of plumbing and house drains. Paving and improving streets are of sanitary interest, and different kinds of street paving have different sanitary values, which should be looked into by the board. Public parks are sanitary features, being the lungs of a city, and timely foresight should be used in urging the reservation of suitable spaces for this purpose.

There are many subjects which boards of health should find interest in, of which space forbids even the mention, but it may be said in a general way that whatever may injuriously affect the public health or tend to improve it, is a matter with which such boards may deal.

Looking back over the past ten years' sanitary work in Ohio, I am able to see a decided improvement in the personnel of boards of health. It is now the rule rather than the exception to find the best citizens of a community serving as members of boards of health. Let us still further increase their usefulness, with a realizing sense

that the most important function of a state—the preservation of the life and health of its citizens—has been entrusted to our care.

Dr. Probst (continuing): I want to call attention to the remark that Mr. Hunter has frequently made in talking upon this subject, and that is, "Let us see what the law says." I think that that should be a question that the members of the boards of health and the health officers should ask themselves. Let us see what the law is. The answer is as plain as language can make it in the health laws of the state, and if they would familiarize themselves with these laws they would know much better what their duties are. [Applause.]

President Wise: You have heard the paper by Dr. Probst. If there is any discussion, or you desire to ask any questions, now is the time.

Mr. Benjamin Bennett: I would like to ask the doctor one question, and that is in the matter of spreading contagious diseases by physicians. What should be done by boards of health where it is positively known that a doctor has been the cause of carrying contagious disease from one house to another? And can a board of health establish any rule whereby a physician must disinfect himself, or clothe himself in a manner that he may visit his patients and not be the means of carrying the disease?

Dr. Probst: There is no question but that boards of health may compel physicians to take reasonable precautions to prevent the carrying of contagious disease. For instance, at Martin's Ferry, where they had an epidemic of small-pox, the board of health adopted a rule that every physician should wear a complete gum suit, including gum cap, gum coat and gum boots.

Dr. Unkefer: I think we were very highly entertained, also very beneficially, by the remarks of Dr. Probst, and I hope the health boards of the different parts of Ohio will give him their hearty support, and I know that he will help them. This meeting has been a source of great enjoyment and benefit to me, and I hope to prove to the citizens of Piqua in the future that they have lost nothing by sending me here to represent them. We have a good Secretary of the State Board, and I think we all ought to stand by him. If it is not out of order, I would like to hear the other paper before any further remarks are made, and then we can have the discussion all together. I put this as a motion.

Motion carried.

A Member: I would like to ask one question before the discussion closes, and that is, are boards of health justified in stopping the use of malt as a feed for cows? I would like to know what the effect is upon the milk.

Dr. Probst: Well, I cannot answer you in a moment, sir. That brings up a very vexatious question, food for milk cows. I think, with

your permission, I will refer the question to Dr. Stanton, of Cincinnati, who is an ex-health officer of that city. He has had to deal with that question, as in Cincinnati they have a great many breweries and they feed their cows malt. I think Dr. Stanton can answer that question better than I can.

Dr. Stanton, Cincinnati: Gentlemen, it would take some time to answer that question in a manner that would be satisfactory to myself and to you. I can only say that in my belief the feeding of a small amount of spent grain, malt as here referred to, is not injurious. However, it should only enter into the composition of the food of the cow to a small extent, be put with other grains and plenty of hay, and the cattle should have plenty of out-door exercise. In a great many dairies where this malt and distilled slop is fed, the trouble is that the cows are kept shut up in stables, and the milk is injured more from that cause than from the feeding of the spent grain. I do not think, as I said before, that the feeding of a small amount of spent grain from the breweries is injurious. It is only a small part of the food of the cows.

Dr. L. S. Lupton, Health Officer of Delaware, was here introduced, and read the following paper:

MEDICAL INSPECTIONS FOR PUBLIC SCHOOLS.

Dr. L. S. Lupton, Health Officer, Delaware.

Mr. President, Ladies and Gentlemen: I have been requested by the secretary of the State Board of Health to present at this meeting a paper on Medical Inspections for Public Schools, a subject entirely new to me, but one deservedly great and important, and I can but regret my inability to do the subject justice. Had some one more experienced in the sanitary work and duties been chosen you probably would have had a more lucid argument in favor and praise of this great sanitary question, medical inspection of public schools. The many important measures we may lack in this paper I hope may be more clearly demonstrated in the discussion. Let us preface our paper by asking a few questions.

How many of our public school buildings have been built with even a thought of the greatest subject before the world, sanitary construction?

How many of our public school buildings are properly lighted, heated and ventilated?

How many of our public schools are provided with proper access and egress, and accommodations for our children?

How are we to guard against children and pupils impregnated with germs of infectious disease before the symptoms are fully developed, being admitted to our public schools?

Indeed, I may well ask, gentlemen, how are we to keep children from families afflicted with infectious or contagious disease out of our schools?

You may say it is the attending physician's duty to report all such diseases to the board of health or health officer, and they in turn shall establish a quarentine, placard the home and keep other children of the family out of school.

But do the physicians do their duty? No! Emphatically, no! There are many, many cases of, I may say, the minor and some of the major infectious and contagious

diseases that the board of health never knows of. Children from these infected families go to our schools and an epidemic occurs in such and such a school, and we have no idea where "they got it."

Can we guard against these epidemics and a great deal of other sickness in our schools? Yes. How? Let us have daily medical inspections.

Again, let me ask how many of our public schools provide anything for our children to drink water from but an old wooden bucket and a rusty tin cup? While we are advocating the individual cup for our sacramental table, for the paternal love we bear our dear children, the future men and women of the world, let us advocate the individual drinking cup for public schools.

Gentlemen, I am heartily in favor of medical inspection for public schools, and let them be physicians of merit, who are fearless in diagnosis and not afraid of making somebody angry if they do their duty. As regarding the *modus operandi* of the medical inspection I am largely indebted to Dr. S. H. Durgin, chairman of the health department of Boston, in which city this method of inspection has been successfully tried during the past year.

I would suggest the dividing of our cities into schools districts, sufficiently large to admit three or four different schools and for each district appoint a physician whose duty it shall be to examine all school buildings and surroundings before the opening of our public schools in the fall of the year, and make and have enforced any sanitary measures that may be needed.

After the opening of the schools their duties are to visit each principal's school in their respective districts daily, shortly after the commencement of the morning session. Let the principal notify the inspector of all cases where the children complain or appear to their teachers to be ill. He, at once shall examine such pupils and advise the teacher as to the propriety of sending the pupil home for the observation and care of its parents or family physician.

Blank books should be provided by the board of health for each school, in which the inspector should record the name of the child, the diagnosis, and advice given. Make these same inspectors agents of the board of health, and serve them daily with a list of all infectious or contagious diseases reported to the board of health, from which they may select the cases that may occur in their respective districts, and visit them and report to the board whether they are isolated satisfactorily or not. If properly isolated, place a card thereon designating satisfactory isolation is found. If not satisfactory, the patient must be sent to a hospital. All work done by the medical inspector should be reported to the board of health monthly.

Although we have been speaking of our larger cities we have not forgotten our smaller cities, towns, villages, and country school and the same or more careful measures must be meted out to them. Give us our medical inspections for public schools. Here is where we need them, not only to look after sickness and infection, but to see that our pupils' eyes are not being strained and tortured, and if he finds any defect in vision or hearing to recommend the parents' immediate attention.

These are the places in which the health officer's duties become burdensome, but so long as we have the good laws of state to back us up we need not shirk. Let us have more law, and medical inspectors for every school in Ohio.

Why am I enthusiastic? Listen to the following, kindly furnished me by Dr. Durgin:

"During the year ending October 31st, 1895, over 14,000 pupils were examined in the schools; 9,000 were found to be sick, and nearly 2,000 sent home, being too sick to remain in school. Among this number the following cases—70 of diphtheria, 26 of scarlet fever, 110 of measles, 44 of chicken-pox, 66 of pediculosis, 28 of whooping cough, 43 of mumps, 42 of scurvies, 8 of congenital syphilis were found in children in their seats, and spreading the disease to others. Over 5,000 cases of sore throat were found, in which no cultures were made."

Gentlemen, I would like to ask if our children going to our public schools are safe? Is there any danger in their going into unsanitary school buildings that are ventilated by pushing a window up on this side of the room and one down at the top on the other side? Is there any danger to their eyes by having the sun shine on a polished desk?

Is there any danger in their drinking water from an old bucket polluted with a thousand germs?

Is there any danger in our children sitting in a closed room with others who may have come in from an infected home?

If there is danger, let us guard against it. Let us have our daily medical inspections, and through their efforts let us have good health, good light, good ventilation, healthy children, and a long and happy life.

S. D. Palmer, Mayor, Covington: When we first organized our board of health we undertook to adopt the by-laws of the boards of some of the larger cities, and we found that it was impossible for us to enforce them at that time. We had to get down to something that we needed for our own village. We adopted the by-laws of other cities and it was a failure, but it is not a failure now. We are getting the people educated to it now and have no trouble to carry into effect the laws that have now been adopted. If we begin in that line we will get the people educated up to a point where they will carry out all the wishes of the board of health.

M. W. Lang, Wellington: Do I understand that paper No. 3 that was on the program this afternoon has been abandoned? I come from a place that gets its water supply partially from wells, and I am very much interested in that paper.

Here Dr. Thomas C. Hoover, of Columbus, was introduced and read the following paper upon "Private Wells:"

PRIVATE WELLS.

By Dr. Thos. C. Hoover, Member State Board of Health, Columbus.

Mr. President: It is not my purpose to discuss the entire subject of wells and well-water, as it would consume more time than would be desirable. I only wish to point out some of the features in connection with the private well that will apply both to the communities without a public supply and to the rural districts, hoping to excite some degree of interest in a matter that has largely been trusted to Providence.

Many of us do not realize that the supply of water from which we have been drinking for so many years is controlled by any laws. We have been accustomed to see springs discharging an abundant supply of bright, sparkling, wholesome water year after year; or, if springs are not conveniently near, a well has been dug or driven, to comparatively shallow depth, and a simple mechanical device has brought to the surface a cool, clear, healthful draught. We have not stopped to consider where the water came from. A well that has, for many years, yielded all that has been required of it, is considered safe and inexhaustible.

All waters are ultimately derived from that vast mass of naturally distilled water which is familiar to us in various forms of mist, dew, rain, hail and snow, called collectively rain-fall. It has been estimated that, under natural conditions, about fifty per cent. of the rain-fall is immediately shed off, and that the remainder is absorbed by the

earth and is found there at varying depths according to the character of the subsoil and underlying strata. The proportions above mentioned vary somewhat according to the character of the soil. The water that is absorbed is called the ground-water, and is the supply from which we get our spring and well waters. It has been found that this ground-water is not stationary but has a distinct current, moving at a rate of two feet per hour; the trend or direction of this current being toward a lower level, where it ultimately finds an outlet. The level of the ground water is determined by the geological formation, the dip of the various substrata, and does not vary greatly. Long continued drouths may lower it in some localities, namely, those which have a comparatively small gathering ground. Intermittent springs, such as are noticed only after a heavy or prolonged moderate rain-fall, indicate an unusual rise of ground water. The giving out of a well after a long continued drouth, shows unusual subsidence.

The location of a well has been generally determined without consideration of the quality or quantity of water that is desired. The house is located and the well dug or driven at a point that is convenient of access. In many instances it is close to the kitchen, for obvious reasons. Sometimes a compromise is affected between the kitchen and the stable or hog pen, or all three. In new territory the water yielded will, in all probability, be of satisfactory purity. The earth possesses unquestionable purifying power, of undetermined duration. As stated before, the current of the ground water is slow, and as it is not subjected to the disturbances that affect surface water, the earth through which it flows is not disturbed in its molecular arrangement.

A well draws its supply from a territory varying in area according to the depth of the well, the character of the soil and underlying strata; and lastly, but not least, the draft that is made upon its store of water. The water is taken from the bottom of the well, and the effect is to pervert the direction of the current of the ground water toward the point from which the water was extracted. This process is repeated many times a day, and many days and years in succession. There is little doubt that the effect on the drained area is to modify its arrangement, and finally more or less numerous channels are cut into the deeper strata by the long continued wearing of the water in its course toward the well.

Coincident with the subterranean changes, modifications of the surface conditions are being brought about. The refuse from the kitchen, such as dishwater, etc., are too frequently thrown on the surface, to be taken into the groundwater. The contributions from the stable and hog-pen are added to these. The privy is very often situated within the area drained by the well, and in the course of years several abandoned vaults are adding a steady supply of poisonous matter to the well's filter-bed. Under such conditions, and I believe that many of my hearers can testify that my picture is not a creation of the imagination, is it any wonder that so-called sporadic cases of typhoid fever and other diarrhœal diseases are met with?

The location of a well for a private family should be as carefully considered as the selection of a water supply for a community. Careful study of the geological formation of the locality should be made; the direction of the ground-water current should be ascertained, and the well never located on the side of the house toward which that flows. Its walls, if it is a dug well, should be carefully laid in cement from above the surface down to the water supply. The integrity of the well should be further scrupulously guarded by sloping the surface from the well in all directions to insure off-flow of the storm-water, and nothing of the nature of dirt or filth should be allowed to lay within the area that it drains.

Dr. Thomas G. Farr, South Charleston: I would like to ask Secretary Probst if his paper will be published in pamphlet form for general distribution among the boards of health?

Dr. Probst: Yes, sir; it will be published with the proceedings of this meeting.

Dr. Farr: I think that this paper ought to be published by itself and distributed, put in the hands of every member of all the boards of health in the state of Ohio. The advice and instruction given there would be of incalculable value to every member of boards of health. They are too much inclined to shirk their duty, too much inclined to put it on to the health officers. I think if they had this paper and would read it and understand it fully, they would be more inclined to attend to their personal duty as a member of the board. I, therefore, move that enough copies of this paper be printed to supply all of the members of boards of health in the state of Ohio.

Motion carried.

President Wise: We are now ready for the general discussion of this paper.

I. A. Oldham, Cambridge: I would like to ask the doctor a question. He has hinted at the matter. We have a stiff clay soil and have been making an effort to have all our vaults brick or stone, thoroughly cemented. He dropped a remark in regard to dry closets. I would like to have a little more information in regard to it. Do you think it advisable to use boxes or dry closets in such soil as we have?

Dr. Probst: I think the dry earth closet is a very admirable way of disposing of such matters where they are properly looked after. Where they are kept clean and a large quantity of dry earth is used it makes an excellent way to dispose of excreta. If they are neglected they get to be quite a nuisance. At Warren they have quite a large number of these boxes in use and, perhaps, some member of that board can give you a little information as to how they do, and that will be interesting to all members.

Thomas B. Webb, Warren: We have about 400 of these boxes in use at Warren, dry earth closets. They are made of wood with drawers that pull out behind the privy, and our rule is that they shall be emptied twice a year or as often as necessary. We have a night soiler who contracts to clean the vaults and we have a record of all these houses that have drawers, and the people have got so used to this system of ours that they come around themselves to the health office and leave their money, which is about $1.00 for cleaning each drawer which holds about nine or ten cubic feet, and we have no trouble. Of course, if there is a drawer that needs cleaning and the people don't clean it, we serve them with a notice or citation to appear before the board and show cause why they should not do it. If they don't appear on our order or citation, the board orders the sanitary policeman to proceed to do the work and charge the expense up to the property. There is a requirement that earth shall be

kept in the house and that it shall be used twice a day. If they are short of earth in the winter they use ashes.

Question: How often do you say they are cleaned?

Mr. Webb: Twice a year, or as often as is necessary.

Question: What is your price for cleaning boxes?

Mr. Webb: For the vaults it is nine cents a cubic foot. Nothing less than 1.00.

Dr. Waltz, Collinwood: We have had quite a little experience with boxes. We have about 375 boxes out of 500 out-houses, and we find this true that where people own their own property where boxes are used, where they use care in using dry earth or ashes, that they are a success. But in cases where this care is not taken they are a grand failure, and the question is, what to do next. We will not allow them to deposit on the ground, and what are we going to do? What are we going to use in the place of boxes? When these boxes become thoroughly soaked, and in hot weather they become very obnoxious, there is going to be a complaint, and while they are better than no boxes, a great many defy the authority of the board of health. The next thing for us to do is to make them build brick boxes. They are made about one and one-half feet deep, extending about one foot to the rear of the out-house, with a lid that drops down and covers the box. The night soil man will lift that lid and clean the box. We have them cleaned only twice a year. The boxes are a failure unless they are well taken care of and a great amount of dry dust or earth used.

Dr. Probst: There is one thing I would like to speak of during the consideration of these boxes, which I have seen recommended. I have no personal experience in the matter. It is theoretical, but I believe it would be a great improvement. The bad odor comes from the absorption of the liquid matters by the wood. Now, it has been recommended that the box before it is first used should receive a heavy coat of pitch or coal tar, and that when it is emptied and properly cleaned, it should be re-coated, and that would prevent the absorption of these liquid filthy matters, and I think this would largely remove cause of the nuisance.

Mr. Giauque, Glendale: We have had some experience with this question of vaults, and I dare say, it gets to be old to those who have read very much. It is an ever-present and an ever-important question, and our experiences will differ. We have tried to get people to adopt the dry box system, but it won't work with us. The reason is, that they will be neglected. We did not adopt in the first place the regulations as suggested by the State Board of Health as to water-tight closets. These closets will fill with water in the clay soil that is saturated with water all the time during the wet seasons. They do fill. A notice will be sent

around to clean a closet. It costs $25, perhaps, and it will be but a short time until the officer will come around again with a notice to clean the closet, and it takes a "long pocket-book;" and the wealthy even find it a drain upon them, and to the poorer classes it is a positive oppression.

I would call your attention to another fact. If I had time I would like to write a paper on this subject. I would like to have Dr. Stanton and Dr. Probst and others give their opinions upon these things, for they are important. You pass along a cemented sidewalk in Columbus, or anywhere else, and observe the raindrops that fall upon it. You see it distinctly, but you watch it only a second and the water disappears within the solid, well made artificial stone. Now, if you stand along side of the ordinary mason and watch every stroke of his trowel and see that he makes the vault according to the prescribed regulations of the board of health, made with brick and cemented inside and outside, and there are no cracks in it, and it would be but a short time until that vault is full of water. My house burned down one night, and in trying to put out the fire we used all the water there was in the cistern. It was a good cistern, for I had given it my personal supervision, and as far as a cistern can be made so it was impervious to water. The fire department had emptied the cistern and I had a man come down and clean it out. That cistern is twelve feet deep and fourteen feet wide, and it was only a short time until that cistern was full of water to the top, and I know that no roof-water ran in there, as the house that had fed it wasn't there; it had burned. The water got into that cistern through the pores of that cement. There is no escape from that.

Dr. Hoover, in his paper, recommended that you cement down to the water supply, and the inference was that you would be safe. You are not safe. While we are seeking wisdom we want to do the best we can, and the State of Ohio wants to do the best it can. I think that our reliance on that kind of a thing for the protection of life from germ diseases, when we are expecting that these cemented walls will protect us in that way, is a very bad thing. I believe that the best filter that is supposed to exclude all sorts of germs does not do it. Now, if the porcelain will not keep germs from passing through it, and cement will not do it, and disease germs get into that vault, they certainly will get outside of it into the soil.

A Member: I was very much impressed with the remarks of Mr. Reed, of Hudson, yesterday, on this line. It seems to me the most practical thing for the village that has no water supply, and that has water works and no sewers. I would be very much pleased if he would repeat what he said last night.

Mr. Reed: Well, we began upon the supposition that the vault or

privy was an utter abomination and could not be made anything else, and it cannot be made anything else. If you want the most unsanitary thing you can get in your surroundings, it is a cess-pool for kitchen slops, a vault for privy offals. As far as we could we required that a privy should be built upon, not low ground, but ground a little elevated, and then the privy walls should be raised two or three feet from the ground upon the masonry. The hollow place under the seats should be lined with brick and cement, so that nothing of a liquid nature dropping in the space below could, by any possible means, get out, and that no surface water could ever flow into it. Then to daily mix with the excreta enough absorbents of dry earth or ashes (lime alone was not sufficient to keep it entirely dry), so that the air would percolate all through it. In my own case the privy is situated away from the house, and back of it I keep an old potato fork, and nearly every day I turn up the lid from the back side and this material I mix thoroughly through it, and once a week I go back there and draw out with this potato fork all the solid contents and put it on the soil, where it acts as a fertilizer, and I can be back in the house in ten minutes.

A Member: Not one man in a thousand would do that.

Mr. Reed: We do not require it, and we have got to educate men to do that. Now, we have a few sewers in that town. The council don't all agree with us, and they have let men in one or two cases connect their kitchen drains with them, and that is another abomination we have not got entirely out of.

While I am on the floor I will just briefly tell you of another device which I have had for eighteen years, and that is my water supply. I constructed a cistern that holds one hundred barrels, thoroughly cemented. I constructed by the side of it a well three feet in diameter, thoroughly cemented, the two walls coming together. I put three or four holes at the bottom of the cistern into the well and put in some clean sponges on the inside of the slope of the wall, for the wall of the big cistern sloped toward the well, and I put in a layer of sand, and gravel, and charcoal, and sand, and iron. I keep the water spout turned off all the time until it rains, and when it has rained half an hour I go out and turn it and the water goes into the cistern and slowly runs through the screening material, that filtering material, just as it would from a natural spring, only slower. It runs in so slowly that at any time when my cistern has six or seven feet of water I can go and pump the well entirely dry in an hour's time, and if necessary, send somebody down to wash the whole surface. I have water that is perfectly limpid, perfectly odorless and clean and clear as the best spring you ever found in the mountain region a thousand miles from any house.

I believe that in our little towns that this is the system of taking care of our privies. I think I made one great mistake. I was advised when I originated this plan to patent my cistern. If I had done that I think it would have been better appreciated and people would have used it, but as it is nobody uses it. [Laughter and applause.]

Mr. Martin: I want to ask a question. It is in regard to selling old and worthless horses and using them as feed for hogs. It is a question that I am particularly interested in, from the fact that it is being carried on in my place against the protests of the people. I would like to know from our worthy secretary, or anybody else that is qualified to answer, whether it is legally or morally wrong?—whether it should be prevented?

Dr. Hoover: I will answer the gentleman. There is no law to prevent it, but we hope there will be soon, because there is a bill introduced in the legislature to that effect today.

Dr. Sutton, Zanesville: I think the whole subject of sanitary perfection is a matter of education. We might fill our statute books full of laws, but the people have to be educated to comply with them. My business has been that of a teacher rather than that of a health officer, but I believe that all great reforms are brought about by education, and I think that every health officer ought to make it a point to have every person in his community educated to a point that he will appreciate these laws and there would not be so much trouble in enforcing them.

Mr. Bennett: What are you going to do with the slaughter-houses where the offal is fed to hogs? That is done through our part of the state almost universally, and what are we going to do with these hogs? Have we any means of inspecting them to know that we are getting healthy pork?

A Member: Our butchers ship these hogs to the city and buy in the country hogs to feed us at home. [Laughter.]

Mr. Bennett: Is there a remedy?

Dr. Hoover: I do not know of any. We contemplated including that in the bill today that was introduced, but recognizing the large interest that perhaps might excite opposition, we thought we would better accomplish a little and hope to get a little more later on. Just as this gentleman over here remarked, the perfection of all sanitary work depends upon the degree of sanitary education that prevails. Among a large number of people, naturally, a great many of them would just as soon eat dirt as anything else, because they have not been educated up to the difference between dirt and substantial, clean food, and just as long as the city people will buy that kind of pork without investigation we will find plenty of people in the business of slaughtering in the rural districts, and in the cities as well, furnishing this material. So far as the consumption of

animal offal is concerned, by hogs, if the hogs are fed in addition a sufficient amount of grain and other food, and provided this offal is not from diseased animals and is not permitted to remain and undergo putrefaction, it is doubtful if it is detrimental. In other words, healthy offal is, perhaps, not injurious to hogs and does not taint the meat, but you can readily understand I have named several conditions that could not obtain in the vicinity of a slaughter-house. There is never anything clean about a slaughter-house, even the butcher's hands, and it would not be expected if he did not wash his hands, that he would pay very much attention to the hog pen.

A Member: I would like to ask if the State Board of Health considers membraneous croup to be contagious?

Mr. Giauque: I would like to ask if there is any way we can have an inspection of cattle before they are killed?

Dr. Hoover: Of course there is.

Dr. Probst: In regard to membraneous croup, I would say that the State Board of Health did adopt a resolution classifying membraneous croup with diphtheria. They did not pretent to say that all cases of membraneous croup were diphtheria, but they say from a sanitary standpoint it is to be treated as such.

S. D. Palmer, Covington: I want to ask whether there is any way by which we can have our cattle inspected in small villages before they are killed? We are having cattle killed that are not fit to be killed, and if we could have some means of having them inspected before they are killed, this matter might be remedied.

Dr. Probst: I would like to read a section of the law that many of you seem not to be familiar with in regard to the inspection of meat: "Sec. 2133. The board of health may appoint such number of inspectors of dairies, slaughter-houses, shops, wagons, appliances, food and water supplies for animals, milk, meat, butter, cheese, and substances purporting to be butter or cheese, or having the semblance of butter or cheese, and such other persons as may be necessary to carry out the provisions of this chapter, define their duties and fix their compensation; and such inspectors may, for such purpose, enter any house, vehicle or yard; and the board of health shall keep for public inspection a record of the names, residence and place of business of all persons engaged in the sale of milk and meat, and may require permits, after inspection, to vent either milk or meat." Now, that would authorize your board of health to enforce a rule that no one should sell meat in your town without a permit from the board of health, and before they get that permit or grant you should make an inspection of their shops, wagons, etc. You could adopt a rule that the meat should have to be inspected before sold in the town.

Question: Inspected before slaughtered?

Dr. Probst: Yes, sir.

C. A. Wilson: I would like to ask the secretary if there is a regular mode of obtaining funds to meet the expenses of a township board. Our first experience was that we had to quarantine a case of diphtheria and there were seventeen people quarantined, and the township paid the expenses, but as to whether there is any other method is a question with the trustees; whether there is some form prescribed by which we should pay these expenses.

Dr. Probst: There is no way of paying the expenses of the township board of health except out of the general fund of the township, and I believe you are limited in the amount of money you can spend. After you have spent the amount of your levy, I presume you could not spend any more for sanitary or other purposes. There was a resolution offered here this morning that seeks to cure that evil and give to the township as well as the municipal board of health a direct fund to draw from for sanitary purposes.

R. C. Phillips: I rise, not for the purpose of asking a question or speaking on any of the papers that have been read, simply to express my pleasure and surprise at the attendance here of our own county. I was here last year and was somewhat surprised. I felt as though I was a stranger. I was the only one here from the southern part of the state. This year I find that we have represented here Springfield, Mill Creek townships, and several of the local boards, such as Lockland and Glendale, which to me is specially gratifying. When I went home to report I said I was ashamed of Hamilton county to think they did not send a representative up here to this convention, and I am highly pleased to-day that I do not have to go back and make that kind of a report. I hope that by next year every single local board and township board of health in Hamilton and Butler counties will have a delegate to this convention, and if they are interested and benefited as much as I have been, they will continue to come. I think that our township has been benefited by my experience here. I think that their report that I made here will show that we have not been afflicted with any contagious or infectious diseases, and not a great many deaths.

Dr. Fitzsimmons, Bucyrus: I am considerable interested in the article on private wells for this reason: In our community we have had a number of cases of typhoid fever commencing in July and August and continuing through August, September, October, November and December. The cases have averaged from twelve to fourteen a month. I notice that when the water supply becomes low our typhoid fever begins. Now, whether there is a concentration of poison in the well—in the water which

has remained; whether the germ of the disease has remained in the well and as its contents are used the poison becomes more concentrated, is a question in my mind. Where the contamination comes from we have not yet determined. Dr. Probst well knows that we have a very unsanitary supply of water. He knows we have a public supply, but we do not use it as a general thing for domestic purposes. Very few of the citizens undertake to use it for cooking purposes; none, I believe, for drinking purposes. But it is a fact that during the prevalence of dry weather the typhoid germ begins to invade and our cases commence. And as a physician in that community, I have had the experience with the rest of them. Now, of course these wells are condemned with us. We do not use any more of that water. It is not safe. I have had families where the disease has broken out from the use of this water, and after the well has become full they get careless and go back to the old well and as a result they continue using it until the supply becomes nearly exhausted, and the next thing is an attack of typhoid fever. We have a community of about 8,000 or 9,000, and we have had about fifty cases. It is not confined to one part of the city; all parts of the city are affected; those remote from the river as well as those near it. Now, the question is, should the wells of that community be entirely condemned or should they not be condemned and the water not used from them any more?

Dr. Hopkins: We have had some trouble in our town in regard to well-water. We have now a system of water supply that we get from Lake Erie, but we found a great many wells that we thought, upon making an examination, were not fit for drinking purposes. We ordered some of them closed and we took out the pump, but that didn't do any good; we then ordered the wells to be filled, and I think that is the duty of every board of health. I don't care if there are two wells in a town or 200. If the wells contain water that is unhealthy or unwholesome and the people will not let it alone, that is the way to proceed. If you cannot warn them enough to stop it, put the source of that water out of existence, if it is possible. Of course, we want to be sure that we are getting at the root of the matter; that we are not getting our source of contagion from some other point.

A Member: I would like to ask a question. In our town we have a property owner who has a well that is contaminated. I would like to know if you would approve of filling that well. He claims that he don't use the water from it. They used the water from it a year ago.

J. V. Giffin, Bradford: Now, during the dry season, and especially in that end of our town where I live, nearly all of the wells are dry. They are used as long as there is any water in them, because there is no other way of getting it. Then there is a corporation well up the street,

and they go and pump that dry two or three times a day. I think they if would boil this water it would not be so bad. They have got to have water and the wells are all dry.

Mr. Smith, Ashtabula: In regard to filtering water, there is one practice which is a good one, I think, and that is raising or forcing water up through a filter.

W. F. Hurr, Martel: I have a question I would like to have answered. There is a pond of stagnant water in a lot near a man's house, and the man that lives close to it has made complaint to the board of health, and it is in bad shape, but the water runs out into the public highway. Now, we would be willing to take the water off of our part, but the other party is not willing to do anything. I would like to know what action we should take to get that drained. Of course we cannot petition to the trustees, as they constitute the board of health.

Dr. Thomas C. Hoover: I simply want to answer one or two inquiries that have been made by these gentlemen, first in regard to the general prevalence of typhoid fever in the fall. That has been the custom for so long that it has been called the autumnal fever. It is probably due to the diminished amount of ground-water and consequently to increased strength, the poisonous matter therein being less dilute. In the winter and spring when the rainfall is at the maximum, the ground-water is at the highest level and the current carries it by the wells in many instances where, when the ground-water is low, it would be deposited in wells. I am prejudiced against wells in old settled localities. I believe there are very few of them that are safe. Many can give a limpid, clear, pleasant water but are very apt to contain disease germs. That I believe to be due to the pernicious practice of filling the earth with poisonous material. Not only the privy vaults, but the waste products from the house, are organic matters that afford a fever nidus for disease germs, and they are both too frequently deposited close to the well. I believe it is an unfortunate thing to have two water supplies in a community. That is to say, a well-water supply for drinking purposes, and pipe-water supply for cooking purposes. It is pretty difficult to tell which is responsible for whatever damage may result. It has been generally conceded that to use a water that is recognized, perhaps, as not being pure for cooking purposes is safe, because we assume that water that is used for cooking purposes is boiled. That is not true. All know better than that. A very large proportion of the water that is used for cooking is not boiled at all. It may be heated, but that is not sufficient. We are positively assured by bacteriologists that disease germs require boiling for a certain length of time, many of them for a considerable length of time, before they are destroyed.

Heating the water does not kill them, so that I think the cooking water may be just as much a source of disease as the drinking water supply.

So far as the question of condemning a well that is close to a vault is concerned and which is alleged not to be used, I believe it is a good policy to condemn anything that is suspicious. You have the right to do it. An open well is of no value if it is not used. It is, in fact, worse than valueless; it is a menace and I think it ought to be filled up, then there cannot be any possible danger that water will be taken from it. I only approve of well water in such places as new localities where there is no poison in the earth, and where there has not been any poison in the earth from waste products. I believe the time will come, and it is not very far in the future, when towns will combine for water supplies, and that that water supply is bound to be purified. I may be getting a little bit cranky on this subject, but I have not heard anything but impure water for the past two years. It has been rung in my ears until I am getting absolutely afraid of water. I do not drink any water, now that I do not know where it comes from, and all about it, and even then I want it boiled and would not object to having it filtered in addition, and at home here in the city every drop of water we drink or use for cooking is boiled and filtered. But wells I believe to be a menace to health unless they are in new regions that have not been settled for any great length of time, and in which the soil has not been poisoned or saturated with poisonous material. If the danger of such a thing had been foreseen in the early settlement of this country, then we might have had a water supply that would be pure and safe. As I intimated in my paper, the territory that is drained by a given well cannot be estimated by any known method. We know that a deep well will draw its supply from a larger area than a shallow well. The peculiar geological formation and the dip of the various strata have much to do in determining the area that will be drained by a well. If we could have an ideal water supply in any place it would be spring water coming from a territory that is arid, that is not a productive soil, and is not readily absorptive, but a large territory that would contribute to a deep water supply and not a shallow well supply.

Question: What do you think about the permeability of a cistern wall?

Dr. Hoover: I do not think there is any doubt about that at all I simply spoke of cementing a wall to prevent the ready egress of water. Cement is not impervious.

Dr. C. H. Quayle, Madison: Many are leaving and it is getting nearly time to adjourn. I move you that we extend to our President and

Secretary and the State Board of Health a vote of thanks for their untiring interest in this work, and that we give to them our hearty co-operation.

Motion carried unanimously.

President Wise: Before adjournment I wish to say to you that we are highly gratified with the success of this convention. We hope you have been benefited to such a great extent that you will return to your homes congratulating yourselves in having been present on this occasion. Wishing you abundant success in the prosecution of your sanitary work, and wishing you abundant prosperity, and hoping to meet you all at our next annual convention, is the sincere desire of the State Board of Health.

And thereupon, on motion, the convention adjourned without day.

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